FCC Test Report

(PART 27)

Report No.:	RF171218C14-2
FCC ID:	NM82Q55200
Test Model:	2Q55200
Received Date:	Dec. 18, 2017
Test Date:	Dec. 21, 2017 ~ Jan. 11, 2018
Issued Date:	Feb. 08, 2018
Applicant:	HTC Corporation
Address:	88 Section 3, Zhongxing Road, Xindian District, New Taipei City 231, Taiwan
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)
Test Location (1):	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.
Test Location (2):	No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan, R.O.C
FCC Registration / Designation Number:	427177 / TW0011

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Release Control Record

Issue No.	Description	Date Issued
RF171218C14-2	Original Release	Feb. 08, 2018

1 Certificate of Conformity

Product: Smartphone

Brand: HTC

Test Model: 2Q55200

Sample Status: Production Unit

Applicant: HTC Corporation

Test Date: Dec. 21, 2017 ~ Jan. 11, 2018

Standards: FCC Part 27, Subpart C, L

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Feb. 08, 2018

Ivonne Wu / Supervisor

Approved by : _____ , **Date:** Feb. 08, 2018

Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2 (WCDMA)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 27.50(d)(4)	Equivalent Isotropic Radiated Power	Pass	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 27.53(h)	Occupied Bandwidth	Pass	Meet the requirement of limit.
27.50(d)(5)	Peak to Average Ratio	Pass	Meet the requirement of limit.
27.53(h)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(h)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -37.26 dB at 3424.80 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 4)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 27.50(d)(4)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 27.53(h)	Occupied Bandwidth	Pass	Meet the requirement of limit.
27.50(d)(5)	Peak to Average Ratio	Pass	Meet the requirement of limit.
27.53(h)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(h)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -36.73 dB at 3440.00 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 12)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 27.50(c)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 27.53(g)	Occupied Bandwidth	Pass	Meet the requirement of limit.
27.50(d)(5)	Peak to Average Ratio	Pass	Meet the requirement of limit.
27.53(g)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(g)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(g)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -43.56 dB at 1422.00 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 13)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 27.50(b)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 27.53(g)	Occupied Bandwidth	Pass	Meet the requirement of limit.
27.50(d)(5)	Peak to Average Ratio	Pass	Meet the requirement of limit.
27.53(g)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(g)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(g)(f)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -18.83 dB at 1564.00 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 17)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 27.50(c)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 27.53(g)	Occupied Bandwidth	Pass	Meet the requirement of limit.
27.50(d)(5)	Peak to Average Ratio	Pass	Meet the requirement of limit.
27.53(g)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(g)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(g)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -44.38 dB at 1422.00 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 66)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 27.50(d)(4)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 27.53(h)	Occupied Bandwidth	Pass	Meet the requirement of limit.
27.50(d)(5)	Peak to Average Ratio	Pass	Meet the requirement of limit.
27.53(h)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(h)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -37.57 dB at 3490.00 MHz.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~ 1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Test Site and Instruments

Description & Manaufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Signal Analyzer Keysight	N9010A	MY56070348	Sep. 13, 2017	Sep. 12, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSW26	102023	Aug. 21, 2017	Aug. 20, 2018
Double Ridge Guide Horn Antenna EMCO	3115	5619	Nov. 30, 2017	Nov. 29, 2018
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 06, 2017	Dec. 05, 2018
Fixed Attenuator Mini-Circuits	BW-N10W5+	NA	Jul. 07, 2017	Jul. 06, 2018
MXG Vector signal generator Agilent	N5182B	MY53050430	Oct. 24, 2017	Oct. 23, 2018
Preamplifier Agilent	310N	187226	Jun. 23, 2017	Jun. 22, 2018
Preamplifier Agilent	83017A	MY39501357	Jun. 23, 2017	Jun. 22, 2018
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 26, 2017	Jun. 25, 2018
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 26, 2017	Jun. 25, 2018
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 08, 2017	Sep. 07, 2018
DC Power Supply Topward	33010D	807748	Oct. 25, 2016	Oct. 24, 2018
Digital Multimeter Fluke	87-III	70360742	Jun. 30, 2017	Jun. 29, 2018

Note:
1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is IC7450I-1.

3 General Information

3.1 General Description of EUT

Product	Smartphone	
Brand	HTC	
Test Model	2Q55200	
Status of EUT	Production Unit	
Power Supply Rating	5 Vdc or 9 Vdc or 12 Vdc (adapter) 5.0 Vdc (host equipment) 3.85 Vdc (Li-ion battery)	
Modulation Type	WCDMA	QPSK
	LTE	QPSK, 16QAM, 64QAM
Frequency Range	WCDMA	1712.4 ~ 1752.6 MHz
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1710.7 ~ 1754.3 MHz
	LTE Band 4 (Channel Bandwidth: 3 MHz)	1711.5 ~ 1753.5 MHz
	LTE Band 4 (Channel Bandwidth: 5 MHz)	1712.5 ~ 1752.5 MHz
	LTE Band 4 (Channel Bandwidth: 10 MHz)	1715.0 ~ 1750.0 MHz
	LTE Band 4 (Channel Bandwidth: 15 MHz)	1717.5 ~ 1747.5 MHz
	LTE Band 4 (Channel Bandwidth: 20 MHz)	1720.0 ~ 1745.0 MHz
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	699.7 ~ 715.3 MHz
	LTE Band 12 (Channel Bandwidth: 3 MHz)	700.5 ~ 714.5 MHz
	LTE Band 12 (Channel Bandwidth: 5 MHz)	701.5 ~ 713.5 MHz
	LTE Band 12 (Channel Bandwidth: 10 MHz)	704.0 ~ 711.0 MHz
	LTE Band 13 (Channel Bandwidth: 5 MHz)	779.5 ~ 784.5 MHz
	LTE Band 13 (Channel Bandwidth: 10 MHz)	782.0 MHz
	LTE Band 17 (Channel Bandwidth: 5 MHz)	706.5 ~ 713.5 MHz
	LTE Band 17 (Channel Bandwidth: 10 MHz)	709.0 ~ 711.0 MHz
	LTE Band 66 (Channel Bandwidth: 1.4 MHz)	1710.7 ~ 1779.3 MHz
	LTE Band 66 (Channel Bandwidth: 3 MHz)	1711.5 ~ 1778.5 MHz
	LTE Band 66 (Channel Bandwidth: 5 MHz)	1712.5 ~ 1777.5 MHz
	LTE Band 66 (Channel Bandwidth: 10 MHz)	1715.0 ~ 1775.0 MHz
	LTE Band 66 (Channel Bandwidth: 15 MHz)	1717.5 ~ 1772.5 MHz
	LTE Band 66 (Channel Bandwidth: 20 MHz)	1720.0 ~ 1770.0 MHz

Emission Designator	WCDMA	4M14F9W
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1M09W7D
	LTE Band 4 (Channel Bandwidth: 3 MHz)	2M70W7D
	LTE Band 4 (Channel Bandwidth: 5 MHz)	4M49W7D
	LTE Band 4 (Channel Bandwidth: 10 MHz)	8M98W7D
	LTE Band 4 (Channel Bandwidth: 15 MHz)	13M5G7D
	LTE Band 4 (Channel Bandwidth: 20 MHz)	17M9W7D
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	1M09W7D
	LTE Band 12 (Channel Bandwidth: 3 MHz)	2M71W7D
	LTE Band 12 (Channel Bandwidth: 5 MHz)	4M49W7D
	LTE Band 12 (Channel Bandwidth: 10 MHz)	8M99W7D
	LTE Band 13 (Channel Bandwidth: 5 MHz)	4M49W7D
	LTE Band 13 (Channel Bandwidth: 10 MHz)	8M97W7D
	LTE Band 17 (Channel Bandwidth: 5 MHz)	4M49W7D
	LTE Band 17 (Channel Bandwidth: 10 MHz)	8M96W7D
	LTE Band 66 (Channel Bandwidth: 1.4 MHz)	1M09W7D
	LTE Band 66 (Channel Bandwidth: 3 MHz)	2M70W7D
	LTE Band 66 (Channel Bandwidth: 5 MHz)	4M49W7D
	LTE Band 66 (Channel Bandwidth: 10 MHz)	8M97W7D
	LTE Band 66 (Channel Bandwidth: 15 MHz)	13M5G7D
	LTE Band 66 (Channel Bandwidth: 20 MHz)	17M9W7D
Max. ERP Power	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	56.87 mW
	LTE Band 12 (Channel Bandwidth: 3 MHz)	57.29 mW
	LTE Band 12 (Channel Bandwidth: 5 MHz)	57.42 mW
	LTE Band 12 (Channel Bandwidth: 10 MHz)	58.47 mW
	LTE Band 13 (Channel Bandwidth: 5 MHz)	50.48 mW
	LTE Band 13 (Channel Bandwidth: 10 MHz)	52.08 mW
	LTE Band 17 (Channel Bandwidth: 5 MHz)	63.96 mW
	LTE Band 17 (Channel Bandwidth: 10 MHz)	65.74 mW
Max. EIRP Power	WCDMA	144.11 mW
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	143.55 mW
	LTE Band 4 (Channel Bandwidth: 3 MHz)	143.22 mW
	LTE Band 4 (Channel Bandwidth: 5 MHz)	144.11 mW
	LTE Band 4 (Channel Bandwidth: 10 MHz)	143.05 mW
	LTE Band 4 (Channel Bandwidth: 15 MHz)	144.11 mW
	LTE Band 4 (Channel Bandwidth: 20 MHz)	145.55 mW
	LTE Band 66 (Channel Bandwidth: 1.4 MHz)	138.68 mW
	LTE Band 66 (Channel Bandwidth: 3 MHz)	139.54 mW
	LTE Band 66 (Channel Bandwidth: 5 MHz)	138.58 mW
	LTE Band 66 (Channel Bandwidth: 10 MHz)	138.32 mW
	LTE Band 66 (Channel Bandwidth: 15 MHz)	140.93 mW
	LTE Band 66 (Channel Bandwidth: 20 MHz)	141.58 mW

Antenna Type	Fixed Internal Antenna
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

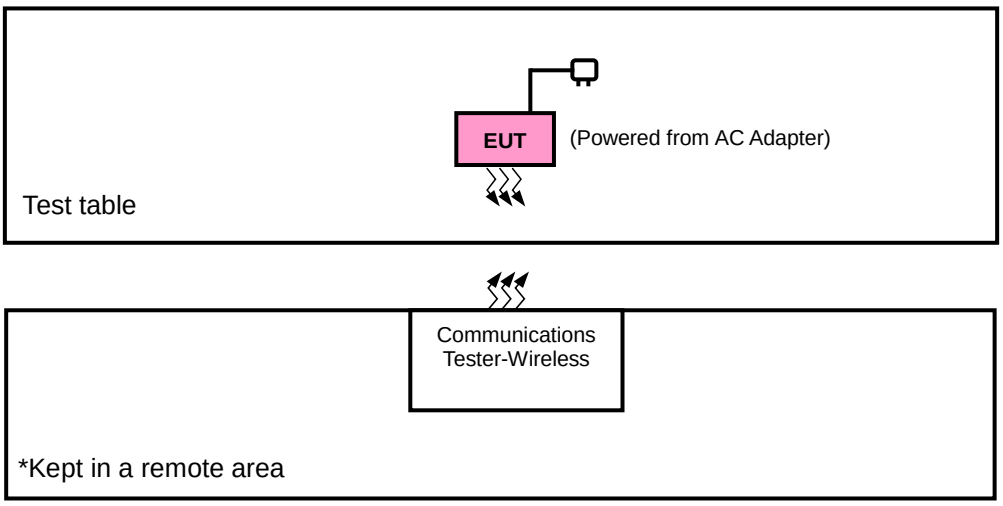
Note:

1. The EUT's accessories list refers to Ext. Pho.
2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

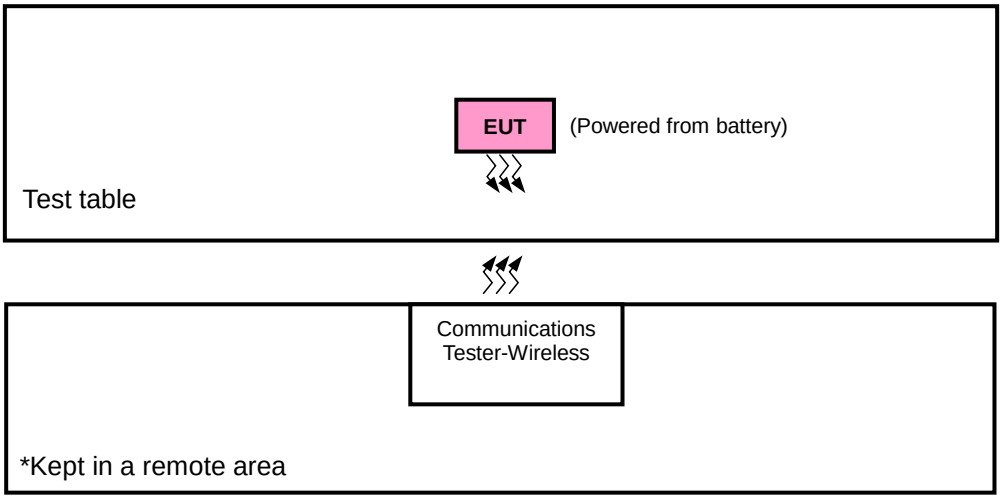
3.2 Configuration of System under Test

For GSM / WCDMA

<Radiated Emission Test>

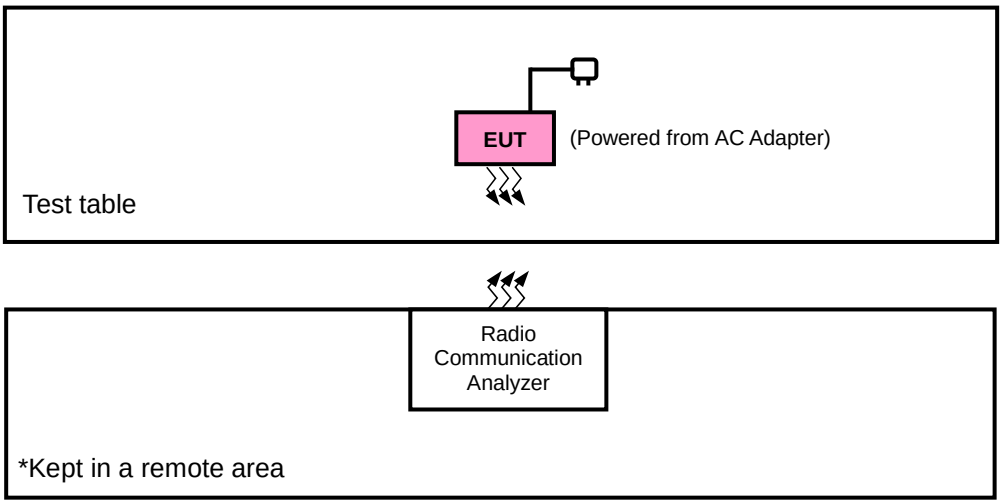


<E.R.P. Test>



For LTE

<Radiated Emission Test>



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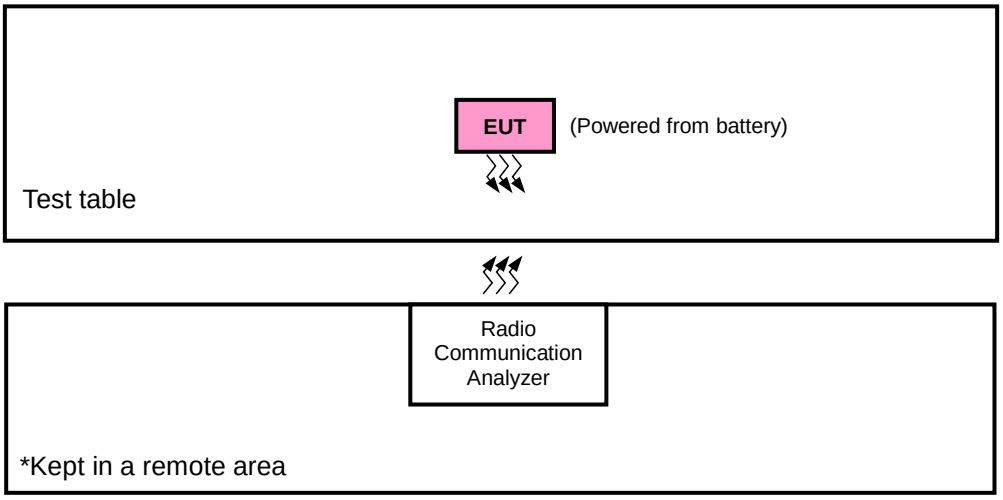


3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Communications Tester-Wireless	Agilent	8960 Series 10	MY53201073	N/A
2.	Radio Communication Analyzer	Anritsu	MT8820C	6201010284	N/A

No.	Signal Cable Description Of The Above Support Units
1.	N/A
2.	N/A

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items 1~2 acted as communication partners to transfer data.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis, and antenna ports

The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

SIM	Band	ERP / EIRP	Radiated Emission
1	WCDMA	X-plane	X-axis
	LTE Band 4	X-plane	X-axis
	LTE Band 12	X-plane	X-axis
	LTE Band 13	X-plane	X-axis
	LTE Band 17	X-plane	Y-axis
	LTE Band 66	X-plane	X-axis

WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	1312 to 1513	1312, 1413, 1513	WCDMA
-	Frequency Stability	1312 to 1513	1312, 1513	WCDMA
-	Occupied Bandwidth	1312 to 1513	1312, 1413, 1513	WCDMA
-	Band Edge	1312 to 1513	1312, 1513	WCDMA
-	Peak to Average Ratio	1312 to 1513	1312, 1413, 1513	WCDMA
-	Conducted Spurious Emission	1312 to 1513	1312, 1413, 1513	WCDMA
-	Radiated Emission	1312 to 1513	1312, 1413, 1513	WCDMA

LTE Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Frequency Stability	19957 to 20393	19957, 20393	1.4 MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	19965, 20385	3 MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20375	5 MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20000, 20350	10 MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20025, 20325	15 MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20300	20 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Band Edge	19957 to 20393	19957	1.4 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			20393	1.4 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		19965 to 20385	19965	3 MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			20385	3 MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		19975 to 20375	19975	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			20375	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		20000 to 20350	20000	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			20350	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		20025 to 20325	20025	15 MHz	QPSK	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
			20325	15 MHz	QPSK	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
		20050 to 20300	20050	20 MHz	QPSK	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
			20300	20 MHz	QPSK	1 RB / 99 RB Offset
						100 RB / 0 RB Offset
-	Conducted Spurious Emission	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

LTE Band 12

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Frequency Stability	23017 to 23173	23017, 23173	1.4 MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23025, 23165	3 MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23035, 23155	5 MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23060, 23130	10 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
-	Peak to Average Ratio	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Band Edge	23017 to 23173	23017	1.4 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			23173	1.4 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		23025 to 23165	23025	3 MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			23165	3 MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		23035 to 23155	23035	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			23155	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		23060 to 23130	23060	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			23130	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
-	Conducted Spurious Emission	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK	1 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Radiated Emission	23060 to 23130	23060, 23095, 23130	10 MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

LTE Band 13

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Frequency Stability	23205 to 23255	23205, 23255	5 MHz	QPSK	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
-	Peak to Average Ratio	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Band Edge	23205 to 23255	23205	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			23255	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			23230	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
-	Conducted Emission	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Spurious Emission	23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

LTE Band 17

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Frequency Stability	23755 to 23825	23755, 23825	5 MHz	QPSK	1 RB / 0 RB Offset
		23780 to 23800	23780, 23800	10 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
-	Peak to Average Ratio	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 12 RB Offset
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 24 RB Offset
-	Band Edge	23755 to 23825	23755	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			23825	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		23780 to 23800	23780	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			23800	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
-	Conducted Emission	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK	1 RB / 0 RB Offset
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Spurious Emission	23780 to 23800	23780, 23790, 23800	10 MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

LTE Band 66

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	131979 to 132665	131979, 132322, 132665	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		131987 to 132657	131987, 132322, 132657	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		131997 to 132647	131997, 132322, 132647	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		132022 to 132622	132022, 132322, 132622	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		132047 to 132597	132047, 132322, 132597	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		132072 to 132572	132072, 132322, 132572	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Frequency Stability	131979 to 132665	131979, 132665	1.4 MHz	QPSK	1 RB / 0 RB Offset
		131987 to 132657	131987, 132657	3 MHz	QPSK	1 RB / 0 RB Offset
		131997 to 132647	131997, 132647	5 MHz	QPSK	1 RB / 0 RB Offset
		132022 to 132622	132022, 132622	10 MHz	QPSK	1 RB / 0 RB Offset
		132047 to 132597	132047, 132597	15 MHz	QPSK	1 RB / 0 RB Offset
		132072 to 132572	132072, 132572	20 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	131979 to 132665	131979, 132322, 132665	1.4 MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset
		131987 to 132657	131987, 132322, 132657	3 MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		131997 to 132647	131997, 132322, 132647	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		132022 to 132622	132022, 132322, 132622	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		132047 to 132597	132047, 132322, 132597	15 MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		132072 to 132572	132072, 132322, 132572	20 MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	131979 to 132665	131979, 132322, 132665	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		131987 to 132657	131987, 132322, 132657	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		131997 to 132647	131997, 132322, 132647	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		132022 to 132622	132022, 132322, 132622	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		132047 to 132597	132047, 132322, 132597	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		132072 to 132572	132072, 132322, 132572	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Band Edge	131979 to 132665	131979	1.4 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			132665	1.4 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		131987 to 132657	131987	3 MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			132657	3 MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		131997 to 132647	131997	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			132647	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		132022 to 132622	132022	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			132622	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		132047 to 132597	132047	15 MHz	QPSK	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
			132597	15 MHz	QPSK	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
		132072 to 132572	132072	20 MHz	QPSK	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
			132572	20 MHz	QPSK	1 RB / 99 RB Offset
						100 RB / 0 RB Offset
-	Conducted Spurious Emission	131979 to 132665	131979, 132322, 132665	1.4 MHz	QPSK	1 RB / 0 RB Offset
		131987 to 132657	131987, 132322, 132657	3 MHz	QPSK	1 RB / 0 RB Offset
		131997 to 132647	131997, 132322, 132647	5 MHz	QPSK	1 RB / 0 RB Offset
		132022 to 132622	132022, 132322, 132622	10 MHz	QPSK	1 RB / 0 RB Offset
		132047 to 132597	132047, 132322, 132597	15 MHz	QPSK	1 RB / 0 RB Offset
		132072 to 132572	132072, 132322, 132572	20 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	132072 to 132572	132072, 132322, 132572	20 MHz	QPSK	1 RB / 0 RB Offset

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP / EIRP	25 deg. C, 65 % RH	3.85 Vdc	Charles Hsiao
Frequency Stability	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Occupied Bandwidth	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Band Edge	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Peak to Average Ratio	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Conducted Spurious Emission	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao & Karl Lee

3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2
FCC 47 CFR Part 27
KDB 971168 D01 Power Meas License Digital Systems v02r02
ANSI/TIA/EIA-603-E 2016
ANSI 63.26-2015

Note: All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

Portable stations (hand-held devices) operating in the 698-787 MHz band are limited to 3 watts ERP

4.1.2 Test Procedures

EIRP / ERP Measurement:

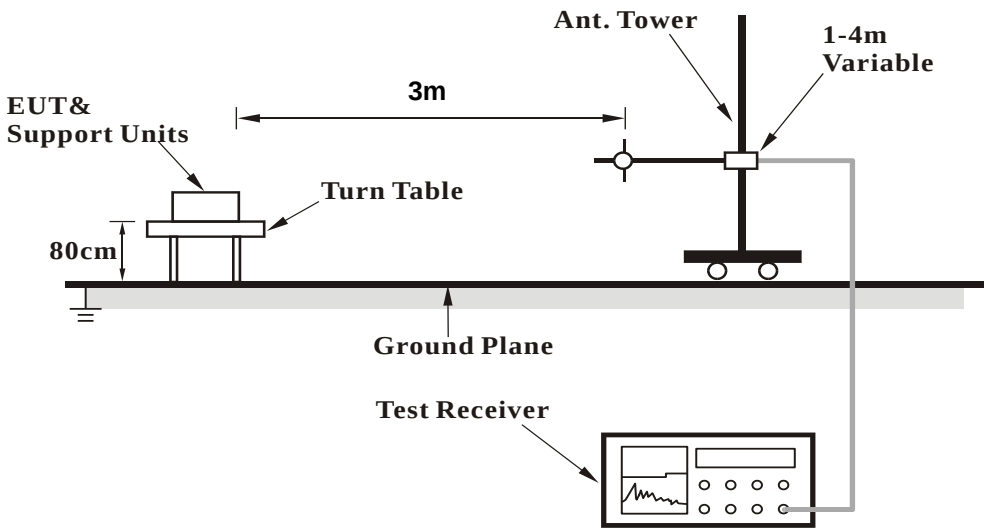
a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5 MHz for WCDMA and 10 MHz for LTE mode.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step b. Record the power level of S.G.
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15 dBi.

Conducted Power Measurement:

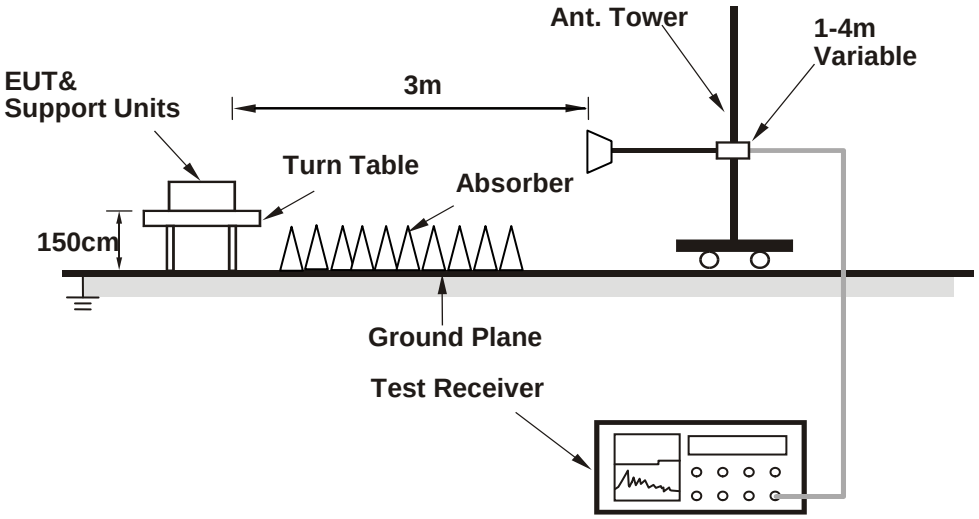
a. The EUT was set up for the maximum power with WCDMA and LTE link data modulation and link up with simulator.
b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 Test Setup

EIRP / ERP Measurement:
<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

Conducted Power Measurement:

4.1.4 Test Results

Conducted Output Power (dBm)

Band	WCDMA IV		
Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
RMC 12.2K	23.69	24.11	23.91
HSDPA Subtest-1	22.75	23.15	23.01
HSDPA Subtest-2	22.88	23.21	23.15
HSDPA Subtest-3	22.32	22.72	22.67
HSDPA Subtest-4	22.30	22.70	22.65
EDGE (8PSK, 1Tx-slot)	22.74	23.14	23.00
EDGE (8PSK, 2Tx-slot)	22.87	23.20	23.14
EDGE (8PSK, 3Tx-slot)	22.31	22.71	22.66
EDGE (8PSK, 4Tx-slot)	22.29	22.69	22.64
HSUPA Subtest-1	22.32	22.53	22.45
HSUPA Subtest-2	20.11	20.34	20.26
HSUPA Subtest-3	21.30	21.50	21.39
HSUPA Subtest-4	20.11	20.32	20.20
HSUPA Subtest-5	22.36	22.55	22.30

LTE Band 4

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20050	20175	20300	
		Frequency (MHz)		1720.0	1732.5	1745.0	
20M	QPSK	1	0	23.98	24.11	24.02	0
		1	50	23.79	23.92	23.83	0
		1	99	23.67	23.80	23.71	0
		50	0	22.85	22.98	22.89	1
		50	25	22.82	22.95	22.86	1
		50	50	22.80	22.93	22.84	1
		100	0	22.74	22.87	22.78	1
	16QAM	1	0	22.96	23.09	23.00	1
		1	50	22.77	22.90	22.81	1
		1	99	22.65	22.78	22.69	1
		50	0	21.83	21.96	21.87	2
		50	25	21.80	21.93	21.84	2
		50	50	21.78	21.91	21.82	2
		100	0	21.72	21.85	21.76	2
	64QAM	1	0	21.91	22.04	21.95	2
		1	50	21.72	21.85	21.76	2
		1	99	21.60	21.73	21.64	2
		50	0	20.78	20.91	20.82	3
		50	25	20.75	20.88	20.79	3
		50	50	20.73	20.86	20.77	3
		100	0	20.67	20.80	20.71	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20025	20175	20325	
		Frequency (MHz)		1717.5	1732.5	1747.5	
15M	QPSK	1	0	23.93	24.06	23.97	0
		1	37	23.74	23.87	23.78	0
		1	74	23.62	23.75	23.66	0
		36	0	22.80	22.93	22.84	1
		36	19	22.77	22.90	22.81	1
		36	39	22.75	22.88	22.79	1
		75	0	22.69	22.82	22.73	1
	16QAM	1	0	22.91	23.04	22.95	1
		1	37	22.72	22.85	22.76	1
		1	74	22.60	22.73	22.64	1
		36	0	21.78	21.91	21.82	2
		36	19	21.75	21.88	21.79	2
		36	39	21.73	21.86	21.77	2
		75	0	21.67	21.80	21.71	2
	64QAM	1	0	21.86	21.99	21.90	2
		1	37	21.67	21.80	21.71	2
		1	74	21.55	21.68	21.59	2
		36	0	20.73	20.86	20.77	3
		36	19	20.70	20.83	20.74	3
		36	39	20.68	20.81	20.72	3
		75	0	20.62	20.75	20.66	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20000	20175	20350	
		Frequency (MHz)		1715.0	1732.5	1750.0	
10M	QPSK	1	0	23.87	24.00	23.91	0
		1	24	23.68	23.81	23.72	0
		1	49	23.56	23.69	23.60	0
		25	0	22.74	22.87	22.78	1
		25	12	22.71	22.84	22.75	1
		25	25	22.69	22.82	22.73	1
		50	0	22.63	22.76	22.67	1
	16QAM	1	0	22.85	22.98	22.89	1
		1	24	22.66	22.79	22.70	1
		1	49	22.54	22.67	22.58	1
		25	0	21.72	21.85	21.76	2
		25	12	21.69	21.82	21.73	2
		25	25	21.67	21.80	21.71	2
		50	0	21.61	21.74	21.65	2
	64QAM	1	0	21.80	21.93	21.84	2
		1	24	21.61	21.74	21.65	2
		1	49	21.49	21.62	21.53	2
		25	0	20.67	20.80	20.71	3
		25	12	20.64	20.77	20.68	3
		25	25	20.62	20.75	20.66	3
		50	0	20.56	20.69	20.60	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		19975	20175	20375	
		Frequency (MHz)		1712.5	1732.5	1752.5	
5M	QPSK	1	0	23.82	23.95	23.86	0
		1	12	23.63	23.76	23.67	0
		1	24	23.51	23.64	23.55	0
		12	0	22.69	22.82	22.73	1
		12	6	22.66	22.79	22.70	1
		12	13	22.64	22.77	22.68	1
		25	0	22.58	22.71	22.62	1
	16QAM	1	0	22.80	22.93	22.84	1
		1	12	22.61	22.74	22.65	1
		1	24	22.49	22.62	22.53	1
		12	0	21.67	21.80	21.71	2
		12	6	21.64	21.77	21.68	2
		12	13	21.62	21.75	21.66	2
		25	0	21.56	21.69	21.60	2
	64QAM	1	0	21.75	21.88	21.79	2
		1	12	21.56	21.69	21.60	2
		1	24	21.44	21.57	21.48	2
		12	0	20.62	20.75	20.66	3
		12	6	20.59	20.72	20.63	3
		12	13	20.57	20.70	20.61	3
		25	0	20.51	20.64	20.55	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		19965	20175	20385	
		Frequency (MHz)		1711.5	1732.5	1753.5	
3M	QPSK	1	0	23.79	23.92	23.83	0
		1	7	23.60	23.73	23.64	0
		1	14	23.48	23.61	23.52	0
		8	0	22.66	22.79	22.70	1
		8	3	22.63	22.76	22.67	1
		8	7	22.61	22.74	22.65	1
		15	0	22.55	22.68	22.59	1
	16QAM	1	0	22.77	22.90	22.81	1
		1	7	22.58	22.71	22.62	1
		1	14	22.46	22.59	22.50	1
		8	0	21.64	21.77	21.68	2
		8	3	21.61	21.74	21.65	2
		8	7	21.59	21.72	21.63	2
		15	0	21.53	21.66	21.57	2
	64QAM	1	0	21.72	21.85	21.76	2
		1	7	21.53	21.66	21.57	2
		1	14	21.41	21.54	21.45	2
		8	0	20.59	20.72	20.63	3
		8	3	20.56	20.69	20.60	3
		8	7	20.54	20.67	20.58	3
		15	0	20.48	20.61	20.52	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		19957	20175	20393	
		Frequency (MHz)		1710.7	1732.5	1754.3	
1.4M	QPSK	1	0	23.72	23.85	23.76	0
		1	2	23.53	23.66	23.57	0
		1	5	23.41	23.54	23.45	0
		3	0	23.39	23.52	23.43	0
		3	1	23.36	23.49	23.40	0
		3	3	23.34	23.47	23.38	0
		6	0	22.48	22.61	22.52	1
	16QAM	1	0	22.70	22.83	22.74	1
		1	2	22.51	22.64	22.55	1
		1	5	22.39	22.52	22.43	1
		3	0	22.37	22.50	22.41	1
		3	1	22.34	22.47	22.38	1
		3	3	22.32	22.45	22.36	1
		6	0	21.46	21.59	21.50	2
	64QAM	1	0	21.65	21.78	21.69	2
		1	2	21.46	21.59	21.50	2
		1	5	21.34	21.47	21.38	2
		3	0	21.32	21.45	21.36	2
		3	1	21.29	21.42	21.33	2
		3	3	21.27	21.40	21.31	2
		6	0	20.41	20.54	20.45	3

LTE Band 12

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		23060	23095	23130	
		Frequency (MHz)		704.0	707.5	711.0	
10M	QPSK	1	0	24.31	24.44	24.38	0
		1	24	24.25	24.33	24.31	0
		1	49	24.28	24.42	24.35	0
		25	0	23.43	23.51	23.48	1
		25	12	23.35	23.40	23.32	1
		25	25	23.38	23.45	23.37	1
		50	0	23.37	23.49	23.41	1
	16QAM	1	0	23.29	23.42	23.36	1
		1	24	23.23	23.31	23.29	1
		1	49	23.26	23.40	23.33	1
		25	0	22.41	22.49	22.46	2
		25	12	22.33	22.38	22.30	2
		25	25	22.36	22.43	22.35	2
		50	0	22.37	22.47	22.39	2
	64QAM	1	0	22.31	22.44	22.38	2
		1	24	22.25	22.33	22.31	2
		1	49	22.28	22.42	22.35	2
		25	0	21.43	21.51	21.48	3
		25	12	21.35	21.40	21.32	3
		25	25	21.38	21.45	21.37	3
		50	0	21.39	21.49	21.41	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		23035	23095	23155	
		Frequency (MHz)		701.5	707.5	713.5	
5M	QPSK	1	0	24.23	24.36	24.30	0
		1	12	24.17	24.25	24.23	0
		1	24	24.20	24.34	24.27	0
		12	0	23.35	23.43	23.40	1
		12	6	23.27	23.32	23.24	1
		12	13	23.30	23.37	23.29	1
		25	0	23.31	23.41	23.33	1
	16QAM	1	0	23.21	23.34	23.28	1
		1	12	23.15	23.23	23.21	1
		1	24	23.18	23.32	23.25	1
		12	0	22.33	22.41	22.38	2
		12	6	22.25	22.30	22.22	2
		12	13	22.28	22.35	22.27	2
		25	0	22.29	22.39	22.31	2
	64QAM	1	0	22.23	22.36	22.30	2
		1	12	22.17	22.25	22.23	2
		1	24	22.20	22.34	22.27	2
		12	0	21.35	21.43	21.40	3
		12	6	21.27	21.32	21.24	3
		12	13	21.30	21.37	21.29	3
		25	0	21.31	21.41	21.33	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		23025	23095	23165	
		Frequency (MHz)		700.5	707.5	714.5	
3M	QPSK	1	0	24.18	24.31	24.25	0
		1	7	24.12	24.20	24.18	0
		1	14	24.15	24.29	24.22	0
		8	0	23.30	23.38	23.35	1
		8	3	23.22	23.27	23.19	1
		8	7	23.25	23.32	23.24	1
		15	0	23.26	23.36	23.28	1
	16QAM	1	0	23.16	23.29	23.23	1
		1	7	23.10	23.18	23.16	1
		1	14	23.13	23.27	23.20	1
		8	0	22.28	22.36	22.33	2
		8	3	22.20	22.25	22.17	2
		8	7	22.23	22.30	22.22	2
		15	0	22.25	22.34	22.26	2
	64QAM	1	0	22.18	22.31	22.25	2
		1	7	22.12	22.20	22.18	2
		1	14	22.15	22.29	22.22	2
		8	0	21.30	21.38	21.35	3
		8	3	21.22	21.27	21.19	3
		8	7	21.25	21.32	21.24	3
		15	0	21.26	21.36	21.28	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		23017	23095	23173	
		Frequency (MHz)		699.7	707.5	715.3	
1.4M	QPSK	1	0	24.11	24.24	24.18	0
		1	2	24.05	24.13	24.11	0
		1	5	24.08	24.22	24.15	0
		3	0	24.03	24.11	24.08	0
		3	1	23.95	24.00	23.92	0
		3	3	23.98	24.05	23.97	0
		6	0	23.19	23.29	23.21	1
	16QAM	1	0	23.09	23.22	23.16	1
		1	2	23.03	23.11	23.09	1
		1	5	23.06	23.20	23.13	1
		3	0	23.01	23.09	23.06	1
		3	1	22.93	22.98	22.90	1
		3	3	22.96	23.03	22.95	1
		6	0	22.17	22.27	22.19	2
	64QAM	1	0	22.11	22.24	22.18	2
		1	2	22.05	22.13	22.11	2
		1	5	22.08	22.22	22.15	2
		3	0	22.03	22.11	22.08	2
		3	1	21.95	22.00	21.92	2
		3	3	21.98	22.05	21.97	2
		6	0	21.19	21.29	21.21	3

LTE Band 13

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel			23230					Channel		23205	23230	23225	
		Frequency (MHz)			782.0					Frequency (MHz)		779.5	782.0	784.5	
10M	QPSK	1	0		24.52		0	5M	QPSK	1	0	24.18	24.37	24.32	0
		1	24		24.51		0			1	12	24.16	24.35	24.30	0
		1	49		24.47		0			1	24	24.13	24.32	24.27	0
		25	0		23.52		1			12	0	23.26	23.45	23.40	1
		25	12		23.5		1			12	6	23.23	23.42	23.37	1
		25	25		23.44		1			12	13	23.20	23.39	23.34	1
		50	0		23.48		1			25	0	23.22	23.41	23.36	1
	16QAM	1	0		23.50		1		16QAM	1	0	23.16	23.35	23.30	1
		1	24		23.49		1			1	12	23.14	23.33	23.28	1
		1	49		23.45		1			1	24	23.11	23.30	23.25	1
		25	0		22.50		2			12	0	22.24	22.43	22.38	2
		25	12		22.48		2			12	6	22.21	22.40	22.35	2
		25	25		22.42		2			12	13	22.18	22.37	22.32	2
		50	0		22.46		2			25	0	22.20	22.39	22.34	2
	64QAM	1	0		22.47		2		64QAM	1	0	22.18	22.37	22.32	2
		1	24		22.46		2			1	12	22.16	22.35	22.30	2
		1	49		22.42		2			1	24	22.13	22.32	22.27	2
		25	0		21.47		3			12	0	21.26	21.45	21.40	3
		25	12		21.45		3			12	6	21.23	21.42	21.37	3
		25	25		21.39		3			12	13	21.20	21.39	21.34	3
		50	0		21.43		3			25	0	21.22	21.41	21.36	3

LTE Band 17

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		23780	23790	23800				Channel		23755	23790	23825	
		Frequency (MHz)		709.0	710.0	711.0				Frequency (MHz)		706.5	710.0	713.5	
10M	QPSK	1	0	24.44	24.48	24.38	0	5M	QPSK	1	0	24.38	24.42	24.32	0
		1	24	24.37	24.42	24.32	0			1	12	24.31	24.36	24.26	0
		1	49	24.27	24.32	24.22	0			1	24	24.21	24.26	24.16	0
		25	0	23.41	23.46	23.36	1			12	0	23.35	23.40	23.30	1
		25	12	23.35	23.40	23.30	1			12	6	23.29	23.34	23.24	1
		25	25	23.38	23.43	23.33	1			12	13	23.32	23.37	23.27	1
		50	0	23.31	23.36	23.26	1			25	0	23.25	23.30	23.20	1
	16QAM	1	0	23.41	23.45	23.35	1		16QAM	1	0	23.35	23.39	23.29	1
		1	24	23.34	23.39	23.29	1			1	12	23.28	23.33	23.23	1
		1	49	23.24	23.29	23.19	1			1	24	23.18	23.23	23.13	1
		25	0	22.38	22.43	22.33	2			12	0	22.32	22.37	22.27	2
		25	12	22.32	22.37	22.27	2			12	6	22.26	22.31	22.21	2
		25	25	22.35	22.40	22.30	2			12	13	22.29	22.34	22.24	2
		50	0	22.28	22.33	22.23	2			25	0	22.22	22.27	22.17	2
	64QAM	1	0	22.36	22.40	22.30	2		64QAM	1	0	22.30	22.34	22.24	2
		1	24	22.29	22.34	22.24	2			1	12	22.23	22.28	22.18	2
		1	49	22.19	22.24	22.14	2			1	24	22.13	22.18	22.08	2
		25	0	21.33	21.38	21.28	3			12	0	21.27	21.32	21.22	3
		25	12	21.27	21.32	21.22	3			12	6	21.21	21.26	21.16	3
		25	25	21.30	21.35	21.25	3			12	13	21.24	21.29	21.19	3
		50	0	21.23	21.28	21.18	3			25	0	21.17	21.22	21.12	3

LTE Band 66

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		132072	132322	132572				Channel		132047	132322	132597	
		Frequency (MHz)		1720.0	1745.0	1770.0				Frequency (MHz)		1717.5	1745.0	1772.5	
20M	QPSK	1	0	23.59	23.95	23.83	0	15M	QPSK	1	0	23.51	23.87	23.75	0
		1	50	23.31	23.64	23.54	0			1	37	23.23	23.56	23.46	0
		1	99	23.36	23.65	23.57	0			1	74	23.28	23.57	23.49	0
		50	0	22.48	22.78	22.62	1			36	0	22.40	22.70	22.54	1
		50	25	22.41	22.65	22.52	1			36	19	22.33	22.57	22.44	1
		50	50	22.43	22.73	22.57	1			36	39	22.35	22.65	22.49	1
		100	0	22.46	22.77	22.58	1			75	0	22.38	22.69	22.50	1
	16QAM	1	0	22.56	22.92	22.80	1		16QAM	1	0	22.48	22.84	22.72	1
		1	50	22.28	22.61	22.51	1			1	37	22.20	22.53	22.43	1
		1	99	22.33	22.62	22.54	1			1	74	22.25	22.54	22.46	1
		50	0	21.45	21.75	21.59	2			36	0	21.37	21.67	21.51	2
		50	25	21.38	21.62	21.49	2			36	19	21.30	21.54	21.41	2
		50	50	21.40	21.70	21.54	2			36	39	21.32	21.62	21.46	2
		100	0	21.43	21.73	21.55	2			75	0	21.35	21.65	21.47	2
	64QAM	1	0	21.51	21.87	21.75	2		64QAM	1	0	21.43	21.79	21.67	2
		1	50	21.23	21.56	21.46	2			1	37	21.15	21.48	21.38	2
		1	99	21.28	21.57	21.49	2			1	74	21.20	21.49	21.41	2
		50	0	20.40	20.70	20.54	3			36	0	20.32	20.62	20.46	3
		50	25	20.33	20.57	20.44	3			36	19	20.25	20.49	20.36	3
		50	50	20.35	20.65	20.49	3			36	39	20.27	20.57	20.41	3
		100	0	20.38	20.68	20.50	3			75	0	20.30	20.60	20.42	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		132022	132322	132622				Channel		131997	132322	132647	
		Frequency (MHz)		1715.0	1745.0	1775.0				Frequency (MHz)		1712.5	1745.0	1777.5	
10M	QPSK	1	0	23.46	23.82	23.70	0	5M	QPSK	1	0	23.43	23.79	23.67	0
		1	24	23.18	23.51	23.41	0			1	12	23.15	23.48	23.38	0
		1	49	23.23	23.52	23.44	0			1	24	23.20	23.49	23.41	0
		25	0	22.35	22.65	22.49	1			12	0	22.32	22.62	22.46	1
		25	12	22.28	22.52	22.39	1			12	6	22.25	22.49	22.36	1
		25	25	22.30	22.60	22.44	1			12	13	22.27	22.57	22.41	1
		50	0	22.33	22.64	22.45	1			25	0	22.30	22.61	22.42	1
	16QAM	1	0	22.43	22.79	22.67	1		16QAM	1	0	22.40	22.76	22.64	1
		1	24	22.15	22.48	22.38	1			1	12	22.12	22.45	22.35	1
		1	49	22.20	22.49	22.41	1			1	24	22.17	22.46	22.38	1
		25	0	21.32	21.62	21.46	2			12	0	21.29	21.59	21.43	2
		25	12	21.25	21.49	21.36	2			12	6	21.22	21.46	21.33	2
		25	25	21.27	21.57	21.41	2			12	13	21.24	21.54	21.38	2
		50	0	21.30	21.60	21.42	2			25	0	21.27	21.57	21.39	2
	64QAM	1	0	21.38	21.74	21.62	2		64QAM	1	0	21.35	21.71	21.59	2
		1	24	21.10	21.43	21.33	2			1	12	21.07	21.40	21.30	2
		1	49	21.15	21.44	21.36	2			1	24	21.12	21.41	21.33	2
		25	0	20.27	20.57	20.41	3			12	0	20.24	20.54	20.38	3
		25	12	20.20	20.44	20.31	3			12	6	20.17	20.41	20.28	3
		25	25	20.22	20.52	20.36	3			12	13	20.19	20.49	20.33	3
		50	0	20.25	20.55	20.37	3			25	0	20.22	20.52	20.34	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		131987	132322	132657				Channel		131979	132322	132665	
		Frequency (MHz)		1711.5	1745.5	1778.5				Frequency (MHz)		1710.7	1745.0	1779.3	
3M	QPSK	1	0	23.38	23.74	23.62	0	1.4M	QPSK	1	0	23.35	23.71	23.59	0
		1	7	23.10	23.43	23.33	0			1	2	23.07	23.40	23.30	0
		1	14	23.15	23.44	23.36	0			1	5	23.12	23.41	23.33	0
		8	0	22.27	22.57	22.41	1			3	0	23.11	23.41	23.25	0
		8	3	22.20	22.44	22.31	1			3	1	23.04	23.28	23.15	0
		8	7	22.22	22.52	22.36	1			3	3	23.06	23.36	23.20	0
		15	0	22.25	22.56	22.37	1			6	0	22.22	22.53	22.34	1
	16QAM	1	0	22.35	22.71	22.59	1		16QAM	1	0	22.32	22.68	22.56	1
		1	7	22.07	22.40	22.30	1			1	2	22.04	22.37	22.27	1
		1	14	22.12	22.41	22.33	1			1	5	22.09	22.38	22.30	1
		8	0	21.24	21.54	21.38	2			3	0	22.08	22.38	22.22	1
		8	3	21.17	21.41	21.28	2			3	1	22.01	22.25	22.12	1
		8	7	21.19	21.49	21.33	2			3	3	22.03	22.33	22.17	1
		15	0	21.22	21.52	21.34	2			6	0	21.19	21.49	21.31	2
	64QAM	1	0	21.30	21.66	21.54	2		64QAM	1	0	21.27	21.63	21.51	2
		1	7	21.02	21.35	21.25	2			1	2	21.02	21.32	21.22	2
		1	14	21.07	21.36	21.28	2			1	5	21.04	21.33	21.25	2
		8	0	20.19	20.49	20.33	3			3	0	21.93	22.23	22.07	2
		8	3	20.12	20.36	20.23	3			3	1	21.86	22.10	21.97	2
		8	7	20.14	20.44	20.28	3			3	3	21.88	22.18	22.02	2
		15	0	20.17	20.47	20.29	3			6	0	20.14	20.44	20.26	3

ERP Power (dBm)

LTE Band 12							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
X	23017	699.7	-13.02	32.719	17.55	56.87	H
	23095	707.5	-13.06	32.736	17.53	56.57	
	23173	715.3	-12.92	32.591	17.52	56.51	
	23017	699.7	-19.00	32.69	11.54	14.26	V
	23095	707.5	-19.15	32.81	11.51	14.16	
	23173	715.3	-19.03	32.74	11.56	14.32	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	23017	699.7	-14.03	32.719	16.54	45.07	H
	23095	707.5	-14.05	32.736	16.54	45.04	
	23173	715.3	-13.95	32.591	16.49	44.58	
	23017	699.7	-20.03	32.69	10.51	11.25	V
	23095	707.5	-20.16	32.81	10.50	11.22	
	23173	715.3	-20.08	32.74	10.51	11.25	
Channel Bandwidth: 1.4 MHz / 64QAM							
X	23017	699.7	-15.07	32.719	15.50	35.47	H
	23095	707.5	-15.06	32.736	15.53	35.69	
	23173	715.3	-14.98	32.591	15.46	35.16	
	23017	699.7	-21.05	32.69	9.49	8.89	V
	23095	707.5	-21.19	32.81	9.47	8.85	
	23173	715.3	-21.05	32.74	9.54	8.99	

LTE Band 12							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23025	700.5	-13.03	32.719	17.54	56.74	H
	23095	707.5	-13.07	32.736	17.51	56.39	
	23165	714.5	-12.86	32.591	17.58	57.29	
	23025	700.5	-19.01	32.69	11.53	14.22	V
	23095	707.5	-19.16	32.81	11.50	14.14	
	23165	714.5	-19.04	32.74	11.55	14.29	
Channel Bandwidth: 3 MHz / 16QAM							
X	23025	700.5	-14.06	32.719	16.51	44.76	H
	23095	707.5	-14.10	32.736	16.49	44.52	
	23165	714.5	-13.87	32.591	16.57	45.40	
	23025	700.5	-20.08	32.69	10.46	11.12	V
	23095	707.5	-20.12	32.81	10.54	11.32	
	23165	714.5	-20.06	32.74	10.53	11.30	
Channel Bandwidth: 3 MHz / 64QAM							
X	23025	700.5	-15.02	32.719	15.55	35.88	H
	23095	707.5	-15.11	32.736	15.48	35.29	
	23165	714.5	-14.90	32.591	15.54	35.82	
	23025	700.5	-21.06	32.69	9.48	8.88	V
	23095	707.5	-21.13	32.81	9.53	8.97	
	23165	714.5	-21.09	32.74	9.50	8.91	

LTE Band 12							
Channel Bandwidth: 5 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
X	23035	701.5	-12.99	32.719	17.58	57.27	H
	23095	707.5	-13.07	32.736	17.52	56.44	
	23155	713.5	-12.85	32.591	17.59	57.42	
	23035	701.5	-19.01	32.69	11.53	14.22	V
	23095	707.5	-19.10	32.81	11.56	14.32	
	23155	713.5	-19.07	32.74	11.52	14.19	
Channel Bandwidth: 5 MHz / 16QAM							
X	23035	701.5	-14.08	32.719	16.49	44.56	H
	23095	707.5	-14.03	32.736	16.56	45.25	
	23155	713.5	-13.90	32.591	16.54	45.09	
	23035	701.5	-20.01	32.69	10.53	11.29	V
	23095	707.5	-20.12	32.81	10.54	11.32	
	23155	713.5	-20.08	32.74	10.51	11.25	
Channel Bandwidth: 5 MHz / 64QAM							
X	23035	701.5	-15.05	32.719	15.52	35.64	H
	23095	707.5	-15.10	32.736	15.49	35.37	
	23155	713.5	-14.96	32.591	15.48	35.33	
	23035	701.5	-21.06	32.69	9.48	8.87	V
	23095	707.5	-21.14	32.81	9.52	8.95	
	23155	713.5	-21.11	32.74	9.48	8.87	

LTE Band 12							
Channel Bandwidth: 10 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
X	23060	704.0	-12.94	32.727	17.64	58.04	H
	23095	707.5	-12.92	32.739	17.67	58.47	
	23130	711.0	-12.99	32.728	17.59	57.39	
	23060	704.0	-18.95	32.75	11.65	14.62	V
	23095	707.5	-19.05	32.81	11.61	14.49	
	23130	711.0	-19.14	32.84	11.55	14.29	
Channel Bandwidth: 10 MHz / 16QAM							
X	23060	704.0	-13.96	32.727	16.62	45.89	H
	23095	707.5	-13.90	32.739	16.69	46.66	
	23130	711.0	-13.97	32.728	16.61	45.79	
	23060	704.0	-19.95	32.75	10.65	11.61	V
	23095	707.5	-20.06	32.81	10.60	11.48	
	23130	711.0	-20.11	32.84	10.58	11.43	
Channel Bandwidth: 10 MHz / 64QAM							
X	23060	704.0	-14.90	32.727	15.68	36.96	H
	23095	707.5	-14.93	32.739	15.66	36.80	
	23130	711.0	-14.98	32.728	15.60	36.29	
	23060	704.0	-21.04	32.75	9.56	9.04	V
	23095	707.5	-21.01	32.81	9.65	9.23	
	23130	711.0	-21.10	32.84	9.59	9.10	

LTE Band 13							
Channel Bandwidth: 5 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
X	23205	779.5	-13.59	32.771	17.03	50.48	H
	23230	782.0	-13.57	32.741	17.02	50.36	
	23255	784.5	-13.70	32.854	17.00	50.16	
	23205	779.5	-19.32	32.5	11.03	12.68	V
	23230	782.0	-19.30	32.52	11.07	12.79	
	23255	784.5	-19.42	32.62	11.05	12.74	
Channel Bandwidth: 5 MHz / 16QAM							
X	23205	779.5	-14.60	32.771	16.02	40.00	H
	23230	782.0	-14.58	32.741	16.01	39.91	
	23255	784.5	-14.68	32.854	16.02	40.03	
	23205	779.5	-20.33	32.5	10.02	10.05	V
	23230	782.0	-20.34	32.52	10.03	10.07	
	23255	784.5	-20.41	32.62	10.06	10.14	
Channel Bandwidth: 5 MHz / 64QAM							
X	23205	779.5	-15.57	32.771	15.05	32.00	H
	23230	782.0	-15.52	32.741	15.07	32.14	
	23255	784.5	-15.67	32.854	15.03	31.87	
	23205	779.5	-21.30	32.5	9.05	8.04	V
	23230	782.0	-21.32	32.52	9.05	8.04	
	23255	784.5	-21.40	32.62	9.07	8.07	

LTE Band 13							
Channel Bandwidth: 10 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
X	23230	782.0	-13.42	32.737	17.17	52.08	H
	23230	782.0	-19.24	32.52	11.13	12.97	V
Channel Bandwidth: 10 MHz / 16QAM							
X	23230	782.0	-14.47	32.737	16.12	40.90	H
	23230	782.0	-20.24	32.52	10.13	10.30	V
Channel Bandwidth: 10 MHz / 64QAM							
X	23230	782.0	-15.46	32.737	15.13	32.56	H
	23230	782.0	-21.20	32.52	9.17	8.26	V

LTE Band 17							
Channel Bandwidth: 5 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
X	23755	706.5	-12.51	32.719	18.06	63.96	H
	23790	710.0	-12.58	32.736	18.01	63.18	
	23825	713.5	-12.39	32.591	18.05	63.84	
	23755	706.5	-18.45	32.69	12.09	16.18	V
	23790	710.0	-18.63	32.81	12.03	15.96	
	23825	713.5	-18.52	32.74	12.07	16.11	
Channel Bandwidth: 5 MHz / 16QAM							
X	23755	706.5	-13.51	32.719	17.06	50.80	H
	23790	710.0	-13.52	32.736	17.07	50.89	
	23825	713.5	-13.39	32.591	17.05	50.71	
	23755	706.5	-19.54	32.69	11.00	12.59	V
	23790	710.0	-19.66	32.81	11.00	12.59	
	23825	713.5	-19.52	32.74	11.07	12.79	
Channel Bandwidth: 5 MHz / 64QAM							
X	23755	706.5	-14.52	32.719	16.05	40.26	H
	23790	710.0	-14.56	32.736	16.03	40.05	
	23825	713.5	-14.40	32.591	16.04	40.19	
	23755	706.5	-20.51	32.69	10.03	10.07	V
	23790	710.0	-20.60	32.81	10.06	10.14	
	23825	713.5	-20.53	32.74	10.06	10.14	

LTE Band 17							
Channel Bandwidth: 10 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
X	23780	709.0	-12.49	32.727	18.09	64.37	H
	23790	710.0	-12.46	32.739	18.13	65.00	
	23800	711.0	-12.40	32.728	18.18	65.74	
	23780	709.0	-18.48	32.75	12.12	16.29	V
	23790	710.0	-18.46	32.81	12.20	16.60	
	23800	711.0	-18.59	32.84	12.10	16.22	
Channel Bandwidth: 10 MHz / 16QAM							
X	23780	709.0	-13.41	32.727	17.17	52.08	H
	23790	710.0	-13.46	32.739	17.13	51.63	
	23800	711.0	-13.48	32.728	17.10	51.26	
	23780	709.0	-19.46	32.75	11.14	13.00	V
	23790	710.0	-19.51	32.81	11.15	13.03	
	23800	711.0	-19.60	32.84	11.09	12.85	
Channel Bandwidth: 10 MHz / 64QAM							
X	23780	709.0	-14.38	32.727	16.20	41.66	H
	23790	710.0	-14.46	32.739	16.13	41.01	
	23800	711.0	-14.50	32.728	16.08	40.53	
	23780	709.0	-20.46	32.75	10.14	10.33	V
	23790	710.0	-20.54	32.81	10.12	10.28	
	23800	711.0	-20.66	32.84	10.03	10.07	

EIRP Power (dBm)

WCDMA							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	1312	1712.4	-20.93	42.49	21.56	143.05	H
	1413	1732.6	-20.74	42.33	21.59	144.11	
	1513	1752.6	-20.53	42.10	21.57	143.55	
	1312	1712.4	-25.46	42.99	17.53	56.62	V
	1413	1732.6	-25.22	42.74	17.52	56.49	
	1513	1752.6	-24.64	42.21	17.57	57.15	

LTE Band 4							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	19957	1710.7	-20.94	42.49	21.55	142.72	H
	20175	1732.5	-20.82	42.33	21.51	141.48	
	20393	1754.3	-20.53	42.10	21.57	143.55	
	19957	1710.7	-25.43	42.99	17.56	57.02	V
	20175	1732.5	-25.21	42.74	17.53	56.62	
	20393	1754.3	-24.66	42.21	17.55	56.89	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	19957	1710.7	-21.95	42.49	20.54	113.11	H
	20175	1732.5	-21.80	42.33	20.53	112.90	
	20393	1754.3	-21.56	42.10	20.54	113.24	
	19957	1710.7	-26.47	42.99	16.52	44.87	V
	20175	1732.5	-26.24	42.74	16.50	44.67	
	20393	1754.3	-25.69	42.21	16.52	44.87	
Channel Bandwidth: 1.4 MHz / 64QAM							
X	19957	1710.7	-22.96	42.49	19.53	89.64	H
	20175	1732.5	-22.81	42.33	19.52	89.47	
	20393	1754.3	-22.57	42.10	19.53	89.74	
	19957	1710.7	-27.43	42.99	15.56	35.97	V
	20175	1732.5	-27.21	42.74	15.53	35.73	
	20393	1754.3	-26.68	42.21	15.53	35.73	

LTE Band 4							
Channel Bandwidth: 3 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
X	19965	1711.5	-20.90	42.49	21.59	144.05	H
	20175	1732.5	-20.83	42.33	21.50	141.16	
	20385	1753.5	-20.54	42.10	21.56	143.22	
	19965	1711.5	-25.42	42.99	17.57	57.15	V
	20175	1732.5	-25.26	42.74	17.48	55.98	
	20385	1753.5	-24.74	42.21	17.47	55.85	
Channel Bandwidth: 3 MHz / 16QAM							
X	19965	1711.5	-21.96	42.49	20.53	112.85	H
	20175	1732.5	-21.82	42.33	20.51	112.38	
	20385	1753.5	-21.53	42.10	20.57	114.02	
	19965	1711.5	-26.43	42.99	16.56	45.29	V
	20175	1732.5	-26.27	42.74	16.47	44.36	
	20385	1753.5	-25.70	42.21	16.51	44.77	
Channel Bandwidth: 3 MHz / 64QAM							
X	19965	1711.5	-22.93	42.49	19.56	90.26	H
	20175	1732.5	-22.85	42.33	19.48	88.65	
	20385	1753.5	-22.57	42.10	19.53	89.74	
	19965	1711.5	-27.46	42.99	15.53	35.73	V
	20175	1732.5	-27.23	42.74	15.51	35.56	
	20385	1753.5	-26.71	42.21	15.50	35.48	

LTE Band 4							
Channel Bandwidth: 5 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
X	19975	1712.5	-20.96	42.49	21.53	142.07	H
	20175	1732.5	-20.74	42.33	21.59	144.11	
	20375	1752.5	-20.55	42.10	21.55	142.89	
	19975	1712.5	-25.46	42.99	17.53	56.62	V
	20175	1732.5	-25.22	42.74	17.52	56.49	
	20375	1752.5	-24.68	42.21	17.53	56.62	
Channel Bandwidth: 5 MHz / 16QAM							
X	19975	1712.5	-21.90	42.49	20.59	114.42	H
	20175	1732.5	-21.74	42.33	20.59	114.47	
	20375	1752.5	-21.56	42.10	20.54	113.24	
	19975	1712.5	-26.48	42.99	16.51	44.77	V
	20175	1732.5	-26.27	42.74	16.47	44.36	
	20375	1752.5	-25.67	42.21	16.54	45.08	
Channel Bandwidth: 5 MHz / 64QAM							
X	19975	1712.5	-22.96	42.49	19.53	89.64	H
	20175	1732.5	-22.75	42.33	19.58	90.72	
	20375	1752.5	-22.56	42.10	19.54	89.95	
	19975	1712.5	-27.46	42.99	15.53	35.73	V
	20175	1732.5	-27.25	42.74	15.49	35.40	
	20375	1752.5	-26.68	42.21	15.53	35.73	

LTE Band 4							
Channel Bandwidth: 10 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
X	20000	1715.0	-20.93	42.49	21.56	143.05	H
	20175	1732.5	-20.78	42.33	21.55	142.79	
	20350	1750.0	-20.56	42.10	21.54	142.56	
	20000	1715.0	-25.46	42.99	17.53	56.62	V
	20175	1732.5	-25.20	42.74	17.54	56.75	
	20350	1750.0	-24.70	42.21	17.51	56.36	
Channel Bandwidth: 10 MHz / 16QAM							
X	20000	1715.0	-21.95	42.49	20.54	113.11	H
	20175	1732.5	-21.80	42.33	20.53	112.90	
	20350	1750.0	-21.57	42.10	20.53	112.98	
	20000	1715.0	-26.43	42.99	16.56	45.29	V
	20175	1732.5	-26.27	42.74	16.47	44.36	
	20350	1750.0	-25.78	42.21	16.43	43.95	
Channel Bandwidth: 10 MHz / 64QAM							
X	20000	1715.0	-22.98	42.49	19.51	89.23	H
	20175	1732.5	-22.83	42.33	19.50	89.06	
	20350	1750.0	-22.54	42.10	19.56	90.36	
	20000	1715.0	-27.46	42.99	15.53	35.73	V
	20175	1732.5	-27.25	42.74	15.49	35.40	
	20350	1750.0	-26.71	42.21	15.50	35.48	

LTE Band 4							
Channel Bandwidth: 15 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
X	20025	1717.5	-20.96	42.49	21.53	142.07	H
	20175	1732.5	-20.74	42.33	21.59	144.11	
	20325	1747.5	-20.55	42.10	21.55	142.89	
	20025	1717.5	-25.42	42.99	17.57	57.15	V
	20175	1732.5	-25.27	42.74	17.47	55.85	
	20325	1747.5	-24.68	42.21	17.53	56.62	
Channel Bandwidth: 15 MHz / 16QAM							
X	20025	1717.5	-21.96	42.49	20.53	112.85	H
	20175	1732.5	-21.76	42.33	20.57	113.95	
	20325	1747.5	-21.50	42.10	20.60	114.82	
	20025	1717.5	-26.47	42.99	16.52	44.87	V
	20175	1732.5	-26.14	42.74	16.60	45.71	
	20325	1747.5	-25.59	42.21	16.62	45.92	
Channel Bandwidth: 15 MHz / 64QAM							
X	20025	1717.5	-22.98	42.49	19.51	89.23	H
	20175	1732.5	-22.74	42.33	19.59	90.93	
	20325	1747.5	-22.53	42.10	19.57	90.57	
	20025	1717.5	-27.45	42.99	15.54	35.81	V
	20175	1732.5	-27.15	42.74	15.59	36.22	
	20325	1747.5	-26.62	42.21	15.59	36.22	

LTE Band 4							
Channel Bandwidth: 20 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
X	20050	1720.0	-20.98	42.49	21.51	141.42	H
	20175	1732.5	-20.76	42.33	21.57	143.45	
	20300	1745.0	-20.47	42.10	21.63	145.55	
	20050	1720.0	-25.46	42.99	17.53	56.62	V
	20175	1732.5	-25.16	42.74	17.58	57.28	
	20300	1745.0	-24.55	42.21	17.66	58.34	
Channel Bandwidth: 20 MHz / 16QAM							
X	20050	1720.0	-21.93	42.49	20.56	113.63	H
	20175	1732.5	-21.70	42.33	20.63	115.53	
	20300	1745.0	-21.42	42.10	20.68	116.95	
	20050	1720.0	-26.47	42.99	16.52	44.87	V
	20175	1732.5	-26.13	42.74	16.61	45.81	
	20300	1745.0	-25.50	42.21	16.71	46.88	
Channel Bandwidth: 20 MHz / 64QAM							
X	20050	1720.0	-22.96	42.49	19.53	89.64	H
	20175	1732.5	-22.71	42.33	19.62	91.56	
	20300	1745.0	-22.45	42.10	19.65	92.26	
	20050	1720.0	-27.43	42.99	15.56	35.97	V
	20175	1732.5	-27.15	42.74	15.59	36.22	
	20300	1745.0	-26.54	42.21	15.67	36.90	

LTE Band 66							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
X	131979	1710.7	-19.02	36.45	17.43	55.34	H
	132322	1745	-19.42	36.80	17.38	54.69	
	132665	1779.3	-19.55	36.94	17.39	54.87	
	131979	1710.7	-15.93	37.28	21.35	136.36	V
	132322	1745	-16.21	37.63	21.42	138.68	
	132665	1779.3	-16.25	37.64	21.39	137.72	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	131979	1710.7	-20.04	36.45	16.41	43.75	H
	132322	1745	-20.44	36.80	16.36	43.24	
	132665	1779.3	-20.53	36.94	16.41	43.78	
	131979	1710.7	-16.95	37.28	20.33	107.82	V
	132322	1745	-17.24	37.63	20.39	109.40	
	132665	1779.3	-17.26	37.64	20.38	109.14	
Channel Bandwidth: 1.4 MHz / 64QAM							
X	131979	1710.7	-21.02	36.45	15.43	34.91	H
	132322	1745	-21.45	36.80	15.35	34.27	
	132665	1779.3	-21.50	36.94	15.44	35.02	
	131979	1710.7	-17.90	37.28	19.38	86.64	V
	132322	1745	-18.21	37.63	19.42	87.50	
	132665	1779.3	-18.26	37.64	19.38	86.70	

LTE Band 66							
Channel Bandwidth: 3 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
X	131987	1711.5	-19.13	36.45	17.32	53.95	H
	132322	1745	-19.42	36.80	17.38	54.69	
	132657	1778.5	-19.60	36.94	17.34	54.24	
	131987	1711.5	-15.83	37.28	21.45	139.54	V
	132322	1745	-16.24	37.63	21.39	137.72	
	132657	1778.5	-16.28	37.64	21.36	136.77	
Channel Bandwidth: 3 MHz / 16QAM							
X	131987	1711.5	-20.11	36.45	16.34	43.05	H
	132322	1745	-20.40	36.80	16.40	43.64	
	132657	1778.5	-20.59	36.94	16.35	43.18	
	131987	1711.5	-16.82	37.28	20.46	111.10	V
	132322	1745	-17.22	37.63	20.41	109.90	
	132657	1778.5	-17.31	37.64	20.33	107.89	
Channel Bandwidth: 3 MHz / 64QAM							
X	131987	1711.5	-21.10	36.45	15.35	34.28	H
	132322	1745	-21.41	36.80	15.39	34.59	
	132657	1778.5	-21.57	36.94	15.37	34.46	
	131987	1711.5	-17.86	37.28	19.42	87.44	V
	132322	1745	-18.23	37.63	19.40	87.10	
	132657	1778.5	-18.26	37.64	19.38	86.70	

LTE Band 66							
Channel Bandwidth: 5 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
X	131997	1712.5	-19.06	36.45	17.39	54.83	H
	132322	1745	-19.44	36.80	17.36	54.44	
	132647	1777.5	-19.51	36.94	17.43	55.34	
	131997	1712.5	-15.86	37.28	21.42	138.58	V
	132322	1745	-16.22	37.63	21.41	138.36	
	132647	1777.5	-16.25	37.64	21.39	137.72	
Channel Bandwidth: 5 MHz / 16QAM							
X	131997	1712.5	-20.01	36.45	16.44	44.06	H
	132322	1745	-20.46	36.80	16.34	43.04	
	132647	1777.5	-20.46	36.94	16.48	44.49	
	131997	1712.5	-16.84	37.28	20.44	110.59	V
	132322	1745	-17.25	37.63	20.38	109.14	
	132647	1777.5	-17.22	37.64	20.42	110.15	
Channel Bandwidth: 5 MHz / 64QAM							
X	131997	1712.5	-21.02	36.45	15.43	34.91	H
	132322	1745	-21.45	36.80	15.35	34.27	
	132647	1777.5	-21.53	36.94	15.41	34.78	
	131997	1712.5	-17.82	37.28	19.46	88.25	V
	132322	1745	-18.26	37.63	19.37	86.50	
	132647	1777.5	-18.16	37.64	19.48	88.72	

LTE Band 66							
Channel Bandwidth: 10 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
X	132022	1715	-19.25	36.64	17.39	54.83	H
	132322	1745	-19.44	36.80	17.36	54.39	
	132622	1775	-19.43	36.80	17.37	54.58	
	132022	1715	-16.04	37.44	21.40	138.01	V
	132322	1745	-16.22	37.63	21.41	138.32	
	132622	1775	-16.26	37.64	21.38	137.25	
Channel Bandwidth: 10 MHz / 16QAM							
X	132022	1715	-20.24	36.64	16.40	43.65	H
	132322	1745	-20.46	36.80	16.34	43.00	
	132622	1775	-20.41	36.80	16.39	43.55	
	132022	1715	-17.03	37.44	20.41	109.88	V
	132322	1745	-17.25	37.63	20.38	109.12	
	132622	1775	-17.24	37.64	20.40	109.52	
Channel Bandwidth: 10 MHz / 64QAM							
X	132022	1715	-21.26	36.64	15.38	34.51	H
	132322	1745	-21.45	36.80	15.35	34.24	
	132622	1775	-21.38	36.80	15.42	34.83	
	132022	1715	-18.02	37.44	19.42	87.48	V
	132322	1745	-18.20	37.63	19.43	87.68	
	132622	1775	-18.20	37.64	19.44	87.80	

LTE Band 66							
Channel Bandwidth: 15 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
X	132047	1717.5	-19.06	36.45	17.39	54.83	H
	132322	1745	-19.42	36.80	17.38	54.69	
	132597	1772.5	-19.49	36.94	17.45	55.63	
	132047	1717.5	-15.83	37.28	21.45	139.54	V
	132322	1745	-16.14	37.63	21.49	140.93	
	132597	1772.5	-16.26	37.64	21.38	137.40	
Channel Bandwidth: 15 MHz / 16QAM							
X	132047	1717.5	-20.04	36.45	16.41	43.75	H
	132322	1745	-20.46	36.80	16.34	43.04	
	132597	1772.5	-20.47	36.94	16.47	44.39	
	132047	1717.5	-16.84	37.28	20.44	110.59	V
	132322	1745	-17.16	37.63	20.47	111.43	
	132597	1772.5	-17.24	37.64	20.40	109.65	
Channel Bandwidth: 15 MHz / 64QAM							
X	132047	1717.5	-21.06	36.45	15.39	34.59	H
	132322	1745	-21.42	36.80	15.38	34.51	
	132597	1772.5	-21.49	36.94	15.45	35.10	
	132047	1717.5	-17.86	37.28	19.42	87.44	V
	132322	1745	-18.19	37.63	19.44	87.90	
	132597	1772.5	-18.24	37.64	19.40	87.10	

LTE Band 66							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	132072	1720	-19.02	36.45	17.43	55.34	H
	132322	1745	-19.28	36.80	17.52	56.48	
	132572	1770	-19.54	36.94	17.40	54.99	
	132072	1720	-15.82	37.28	21.46	139.86	V
	132322	1745	-16.12	37.63	21.51	141.58	
	132572	1770	-16.15	37.64	21.49	140.93	
Channel Bandwidth: 20 MHz / 16QAM							
X	132072	1720	-20.02	36.45	16.43	43.95	H
	132322	1745	-20.26	36.80	16.54	45.07	
	132572	1770	-20.52	36.94	16.42	43.88	
	132072	1720	-16.80	37.28	20.48	111.61	V
	132322	1745	-17.10	37.63	20.53	112.98	
	132572	1770	-17.18	37.64	20.46	111.17	
Channel Bandwidth: 20 MHz / 64QAM							
X	132072	1720	-21.06	36.45	15.39	34.59	H
	132322	1745	-21.29	36.80	15.51	35.55	
	132572	1770	-21.56	36.94	15.38	34.54	
	132072	1720	-18.83	37.28	18.45	69.94	V
	132322	1745	-18.11	37.63	19.52	89.54	
	132572	1770	-18.19	37.64	19.45	88.10	

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stabiliity Measurement

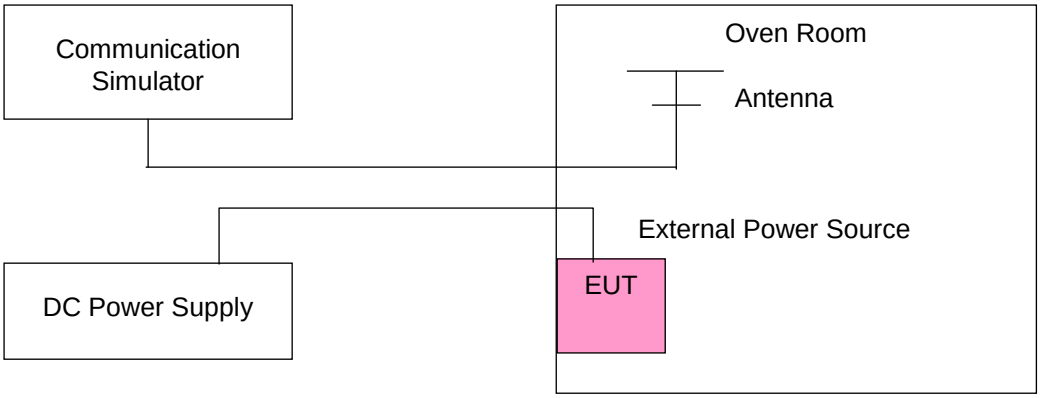
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

4.2.2 Test Procedure

a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5 ℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

Note: The frequency error was recorded frequency error from the communication simulator.

4.2.3 Test Setup



4.2.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	WCDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	1712.400003	0.001	1752.600003	0.002	2.5
3.6	1712.400004	0.002	1752.600001	0.001	2.5
4.4	1712.400002	0.001	1752.600002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	WCDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1712.400003	0.001	1752.600003	0.002	2.5
-20	1712.400004	0.002	1752.600002	0.001	2.5
-10	1712.400002	0.001	1752.600004	0.002	2.5
0	1712.400004	0.002	1752.600003	0.002	2.5
10	1712.400002	0.001	1752.600002	0.001	2.5
20	1712.399997	-0.002	1752.599997	-0.002	2.5
30	1712.399998	-0.001	1752.599999	-0.001	2.5
40	1712.399998	-0.001	1752.599999	-0.001	2.5
50	1712.399998	-0.001	1752.599998	-0.001	2.5
55	1712.399999	-0.001	1752.599999	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	1710.700003	0.002	1754.300003	0.001	2.5
3.6	1710.700003	0.002	1754.300002	0.001	2.5
4.4	1710.700004	0.002	1754.300001	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1710.700001	0.001	1754.300001	0.001	2.5
-20	1710.700003	0.002	1754.300002	0.001	2.5
-10	1710.700003	0.002	1754.300002	0.001	2.5
0	1710.700002	0.001	1754.300002	0.001	2.5
10	1710.700002	0.001	1754.300003	0.001	2.5
20	1710.699999	-0.001	1754.299998	-0.001	2.5
30	1710.699997	-0.002	1754.299998	-0.001	2.5
40	1710.699998	-0.001	1754.299998	-0.001	2.5
50	1710.699997	-0.002	1754.299998	-0.001	2.5
55	1710.699999	-0.001	1754.299997	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	1711.500001	0.001	1753.500002	0.001	2.5
3.6	1711.500003	0.002	1753.500002	0.001	2.5
4.4	1711.500004	0.002	1753.500002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1711.500003	0.002	1753.500004	0.002	2.5
-20	1711.500002	0.001	1753.500002	0.001	2.5
-10	1711.500004	0.002	1753.500003	0.002	2.5
0	1711.500003	0.002	1753.500002	0.001	2.5
10	1711.500002	0.001	1753.500003	0.002	2.5
20	1711.499998	-0.001	1753.499997	-0.002	2.5
30	1711.499998	-0.001	1753.499997	-0.002	2.5
40	1711.499998	-0.001	1753.499998	-0.001	2.5
50	1711.499996	-0.002	1753.499997	-0.002	2.5
55	1711.499998	-0.001	1753.499997	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	1712.500004	0.002	1752.500004	0.002	2.5
3.6	1712.500002	0.001	1752.500002	0.001	2.5
4.4	1712.500003	0.002	1752.500003	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1712.500003	0.002	1752.500002	0.001	2.5
-20	1712.500003	0.002	1752.500004	0.002	2.5
-10	1712.500003	0.002	1752.500003	0.002	2.5
0	1712.500002	0.001	1752.500004	0.002	2.5
10	1712.500002	0.001	1752.500004	0.002	2.5
20	1712.499997	-0.002	1752.499998	-0.001	2.5
30	1712.499998	-0.001	1752.499997	-0.002	2.5
40	1712.499996	-0.002	1752.499998	-0.001	2.5
50	1712.499998	-0.001	1752.499999	-0.001	2.5
55	1712.499998	-0.001	1752.499998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	1715.000004	0.002	1750.000004	0.002	2.5
3.6	1715.000003	0.002	1750.000001	0.001	2.5
4.4	1715.000003	0.002	1750.000001	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1715.000002	0.001	1750.000002	0.001	2.5
-20	1715.000003	0.002	1750.000001	0.001	2.5
-10	1715.000003	0.002	1750.000004	0.002	2.5
0	1715.000003	0.002	1750.000004	0.002	2.5
10	1715.000004	0.002	1750.000002	0.001	2.5
20	1714.999998	-0.001	1749.999997	-0.002	2.5
30	1714.999999	-0.001	1749.999999	-0.001	2.5
40	1714.999999	-0.001	1749.999998	-0.001	2.5
50	1714.999998	-0.001	1749.999998	-0.001	2.5
55	1714.999999	-0.001	1749.999997	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	1717.500003	0.002	1747.500003	0.002	2.5
3.6	1717.500001	0.001	1747.500003	0.002	2.5
4.4	1717.500004	0.002	1747.500001	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1717.500004	0.002	1747.500003	0.002	2.5
-20	1717.500002	0.001	1747.500002	0.001	2.5
-10	1717.500004	0.002	1747.500001	0.001	2.5
0	1717.500003	0.002	1747.500003	0.001	2.5
10	1717.500002	0.001	1747.500002	0.001	2.5
20	1717.499998	-0.001	1747.499998	-0.001	2.5
30	1717.499999	-0.001	1747.499998	-0.001	2.5
40	1717.499999	-0.001	1747.499997	-0.002	2.5
50	1717.499998	-0.001	1747.499998	-0.001	2.5
55	1717.499998	-0.001	1747.499999	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	1720.000001	0.001	1745.000003	0.002	2.5
3.6	1720.000002	0.001	1745.000004	0.002	2.5
4.4	1720.000002	0.001	1745.000003	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1720.000004	0.002	1745.000001	0.001	2.5
-20	1720.000001	0.001	1745.000002	0.001	2.5
-10	1720.000002	0.001	1745.000002	0.001	2.5
0	1720.000001	0.001	1745.000004	0.002	2.5
10	1720.000002	0.001	1745.000004	0.002	2.5
20	1719.999999	-0.001	1744.999998	-0.001	2.5
30	1719.999996	-0.002	1744.999997	-0.002	2.5
40	1719.999996	-0.002	1744.999998	-0.001	2.5
50	1719.999999	-0.001	1744.999998	-0.001	2.5
55	1719.999997	-0.002	1744.999997	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	699.700002	0.002	715.300004	0.006	2.5
3.6	699.700002	0.002	715.300002	0.003	2.5
4.4	699.700003	0.004	715.300004	0.006	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	699.700003	0.005	715.300003	0.004	2.5
-20	699.700003	0.004	715.300002	0.003	2.5
-10	699.700004	0.005	715.300002	0.003	2.5
0	699.700002	0.003	715.300002	0.003	2.5
10	699.700002	0.003	715.300002	0.003	2.5
20	699.699997	-0.005	715.299998	-0.003	2.5
30	699.699998	-0.004	715.299998	-0.003	2.5
40	699.699996	-0.005	715.299999	-0.002	2.5
50	699.699998	-0.003	715.299997	-0.004	2.5
55	699.699999	-0.001	715.299997	-0.005	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	700.500002	0.003	714.500002	0.003	2.5
3.6	700.500003	0.004	714.500002	0.002	2.5
4.4	700.500003	0.005	714.500001	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	700.500003	0.005	714.500003	0.004	2.5
-20	700.500004	0.005	714.500002	0.003	2.5
-10	700.500002	0.003	714.500004	0.006	2.5
0	700.500002	0.002	714.500004	0.005	2.5
10	700.500003	0.004	714.500002	0.003	2.5
20	700.499999	-0.002	714.499999	-0.002	2.5
30	700.499997	-0.005	714.499996	-0.005	2.5
40	700.499998	-0.003	714.499996	-0.005	2.5
50	700.499997	-0.004	714.499999	-0.002	2.5
55	700.499998	-0.003	714.499997	-0.004	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	701.500002	0.003	713.500004	0.005	2.5
3.6	701.500003	0.004	713.500003	0.004	2.5
4.4	701.500002	0.003	713.500002	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	701.500004	0.005	713.500002	0.003	2.5
-20	701.500003	0.004	713.500002	0.003	2.5
-10	701.500003	0.004	713.500002	0.002	2.5
0	701.500003	0.005	713.500004	0.005	2.5
10	701.500003	0.005	713.500002	0.003	2.5
20	701.499996	-0.005	713.499996	-0.006	2.5
30	701.499998	-0.003	713.499998	-0.002	2.5
40	701.499997	-0.004	713.499998	-0.003	2.5
50	701.499999	-0.002	713.499997	-0.004	2.5
55	701.499999	-0.002	713.499999	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	704.000003	0.004	711.000001	0.002	2.5
3.6	704.000002	0.003	711.000004	0.005	2.5
4.4	704.000002	0.003	711.000002	0.003	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	704.000002	0.003	711.000002	0.003	2.5
-20	704.000003	0.004	711.000004	0.005	2.5
-10	704.000004	0.006	711.000002	0.003	2.5
0	704.000001	0.001	711.000002	0.003	2.5
10	704.000004	0.005	711.000002	0.002	2.5
20	703.999997	-0.004	710.999997	-0.005	2.5
30	703.999999	-0.001	710.999998	-0.003	2.5
40	703.999996	-0.006	710.999998	-0.003	2.5
50	703.999996	-0.006	710.999997	-0.005	2.5
55	703.999996	-0.005	710.999998	-0.003	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	779.500003	0.004	784.500002	0.003	2.5
3.6	779.500003	0.003	784.500002	0.003	2.5
4.4	779.500004	0.004	784.500001	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 13				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	779.500004	0.005	784.500003	0.003	2.5
-20	779.500003	0.004	784.500001	0.002	2.5
-10	779.500003	0.004	784.500003	0.004	2.5
0	779.500002	0.002	784.500002	0.003	2.5
10	779.500003	0.003	784.500004	0.005	2.5
20	779.499998	-0.002	784.499998	-0.002	2.5
30	779.499998	-0.002	784.499999	-0.002	2.5
40	779.499999	-0.002	784.499997	-0.004	2.5
50	779.499998	-0.002	784.499996	-0.005	2.5
55	779.499997	-0.004	784.499996	-0.005	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
3.85	782.000003	0.004	2.5
3.6	782.000003	0.004	2.5
4.4	782.000002	0.003	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 13		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
-30	782.000002	0.003	2.5
-20	782.000004	0.005	2.5
-10	782.000003	0.003	2.5
0	782.000002	0.002	2.5
10	782.000002	0.002	2.5
20	781.999997	-0.004	2.5
30	781.999998	-0.003	2.5
40	781.999999	-0.002	2.5
50	781.999998	-0.003	2.5
55	781.999999	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 17				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	706.500002	0.003	713.500002	0.003	2.5
3.6	706.500004	0.005	713.500002	0.003	2.5
4.4	706.500004	0.005	713.500004	0.005	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 17				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	706.500003	0.004	713.500002	0.003	2.5
-20	706.500002	0.003	713.500003	0.005	2.5
-10	706.500003	0.004	713.500001	0.002	2.5
0	706.500002	0.002	713.500003	0.004	2.5
10	706.500002	0.003	713.500004	0.005	2.5
20	706.499997	-0.004	713.499998	-0.003	2.5
30	706.499998	-0.002	713.499996	-0.005	2.5
40	706.499998	-0.003	713.499997	-0.004	2.5
50	706.499997	-0.005	713.499998	-0.003	2.5
55	706.499997	-0.005	713.499999	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 17				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	709.000002	0.003	711.000002	0.002	2.5
3.6	709.000003	0.004	711.000002	0.002	2.5
4.4	709.000004	0.005	711.000002	0.003	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 17				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	709.000001	0.002	711.000004	0.005	2.5
-20	709.000003	0.005	711.000002	0.003	2.5
-10	709.000002	0.003	711.000004	0.005	2.5
0	709.000003	0.004	711.000001	0.002	2.5
10	709.000003	0.004	711.000003	0.005	2.5
20	708.999997	-0.004	710.999999	-0.002	2.5
30	708.999997	-0.004	710.999998	-0.003	2.5
40	708.999998	-0.002	710.999999	-0.002	2.5
50	708.999998	-0.002	710.999998	-0.002	2.5
55	708.999998	-0.003	710.999998	-0.003	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	1710.700004	0.002	1779.300002	0.001	2.5
3.6	1710.700003	0.001	1779.300002	0.001	2.5
4.4	1710.700004	0.002	1779.300003	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1710.700003	0.002	1779.300004	0.002	2.5
-20	1710.700003	0.002	1779.300004	0.002	2.5
-10	1710.700001	0.001	1779.300002	0.001	2.5
0	1710.700003	0.002	1779.300004	0.002	2.5
10	1710.700004	0.002	1779.300003	0.002	2.5
20	1710.699999	-0.001	1779.299997	-0.002	2.5
30	1710.699997	-0.002	1779.299999	-0.001	2.5
40	1710.699997	-0.002	1779.299999	-0.001	2.5
50	1710.699996	-0.002	1779.299997	-0.002	2.5
55	1710.699998	-0.001	1779.299999	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	1711.500003	0.002	1778.500001	0.001	2.5
3.6	1711.500004	0.002	1778.500001	0.001	2.5
4.4	1711.500002	0.001	1778.500001	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1711.500002	0.001	1778.500003	0.001	2.5
-20	1711.500001	0.001	1778.500001	0.001	2.5
-10	1711.500004	0.002	1778.500004	0.002	2.5
0	1711.500004	0.002	1778.500003	0.001	2.5
10	1711.500001	0.001	1778.500004	0.002	2.5
20	1711.499996	-0.002	1778.499998	-0.001	2.5
30	1711.499998	-0.001	1778.499997	-0.001	2.5
40	1711.499999	-0.001	1778.499998	-0.001	2.5
50	1711.499998	-0.001	1778.499999	-0.001	2.5
55	1711.499996	-0.002	1778.499998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	1712.500002	0.001	1777.500004	0.002	2.5
3.6	1712.500002	0.001	1777.500004	0.002	2.5
4.4	1712.500002	0.001	1777.500003	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1712.500003	0.002	1777.500002	0.001	2.5
-20	1712.500004	0.002	1777.500002	0.001	2.5
-10	1712.500003	0.002	1777.500003	0.002	2.5
0	1712.500002	0.001	1777.500003	0.002	2.5
10	1712.500002	0.001	1777.500002	0.001	2.5
20	1712.499996	-0.002	1777.499999	-0.001	2.5
30	1712.499997	-0.002	1777.499996	-0.002	2.5
40	1712.499997	-0.002	1777.499997	-0.001	2.5
50	1712.499998	-0.001	1777.499997	-0.002	2.5
55	1712.499998	-0.001	1777.499996	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	1715.000001	0.001	1775.000004	0.002	2.5
3.6	1715.000004	0.002	1775.000004	0.002	2.5
4.4	1715.000001	0.001	1775.000003	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1715.000001	0.001	1775.000003	0.002	2.5
-20	1715.000002	0.001	1775.000003	0.002	2.5
-10	1715.000002	0.001	1775.000004	0.002	2.5
0	1715.000002	0.001	1775.000004	0.002	2.5
10	1715.000002	0.001	1775.000004	0.002	2.5
20	1714.999997	-0.002	1774.999998	-0.001	2.5
30	1714.999999	-0.001	1774.999998	-0.001	2.5
40	1714.999996	-0.002	1774.999997	-0.002	2.5
50	1714.999998	-0.001	1774.999997	-0.002	2.5
55	1714.999998	-0.001	1774.999998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	1717.500004	0.002	1772.500003	0.002	2.5
3.6	1717.500003	0.002	1772.500003	0.002	2.5
4.4	1717.500002	0.001	1772.500001	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1717.500003	0.002	1772.500003	0.001	2.5
-20	1717.500003	0.002	1772.500004	0.002	2.5
-10	1717.500001	0.001	1772.500003	0.001	2.5
0	1717.500004	0.002	1772.500003	0.002	2.5
10	1717.500003	0.001	1772.500001	0.001	2.5
20	1717.499998	-0.001	1772.499998	-0.001	2.5
30	1717.499997	-0.002	1772.499996	-0.002	2.5
40	1717.499998	-0.001	1772.499999	-0.001	2.5
50	1717.499997	-0.002	1772.499997	-0.002	2.5
55	1717.499996	-0.002	1772.499998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	1720.000003	0.002	1770.000002	0.001	2.5
3.6	1720.000003	0.002	1770.000004	0.002	2.5
4.4	1720.000003	0.002	1770.000004	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1720.000004	0.002	1770.000002	0.001	2.5
-20	1720.000003	0.002	1770.000001	0.001	2.5
-10	1720.000003	0.002	1770.000004	0.002	2.5
0	1720.000004	0.002	1770.000002	0.001	2.5
10	1720.000003	0.002	1770.000004	0.002	2.5
20	1719.999996	-0.002	1769.999997	-0.002	2.5
30	1719.999996	-0.002	1769.999998	-0.001	2.5
40	1719.999999	-0.001	1769.999999	-0.001	2.5
50	1719.999999	-0.001	1769.999999	-0.001	2.5
55	1719.999997	-0.002	1769.999996	-0.002	2.5

4.3 Occupied Bandwidth Measurement

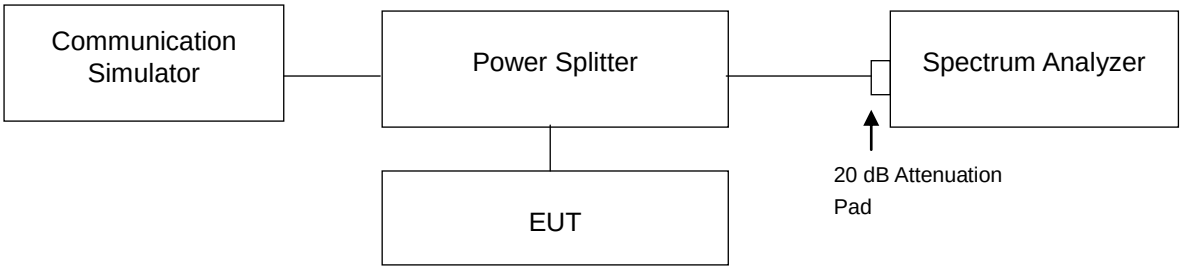
4.3.1 Limits of Occupied Bandwidth Measurement

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

4.3.2 Test Procedure

a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

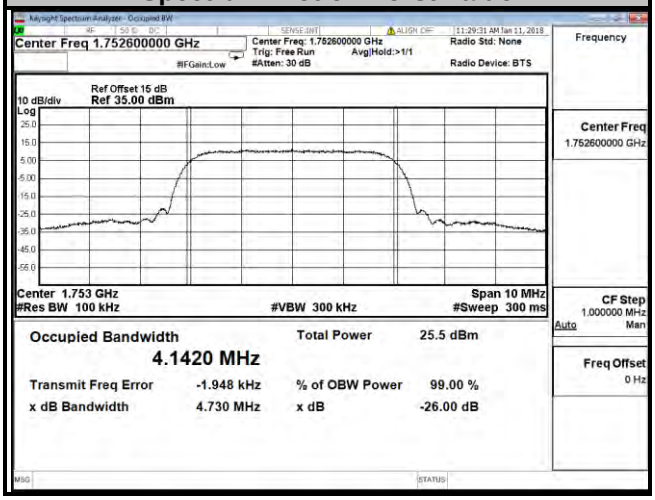
4.3.3 Test Setup



4.3.4 Test Result

WCDMA		
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**
1312	1712.4	4.1377
1413	1732.6	4.1403
1513	1752.6	4.1420

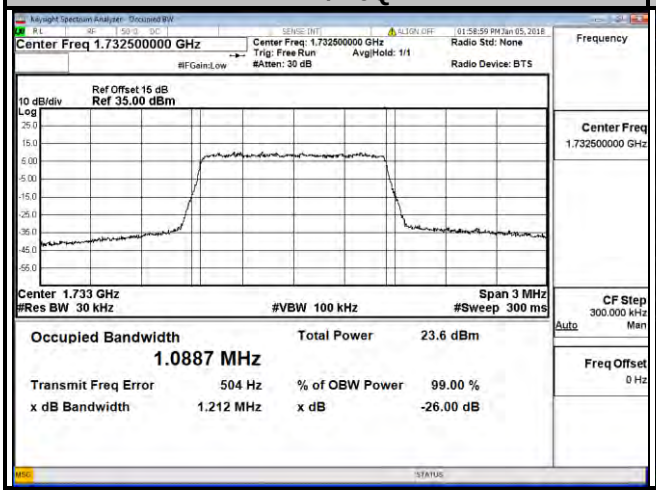
Spectrum Plot of Worst Value



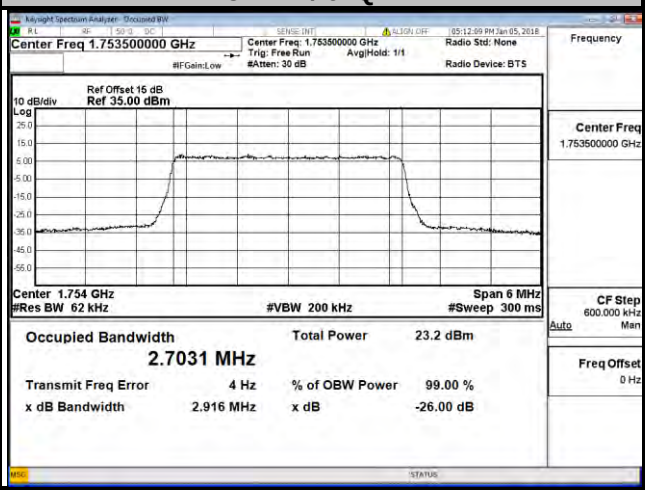
LTE Band 4									
Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
19957	1710.7	1.0875	1.0856	1.0858	19965	1711.5	2.7001	2.6961	2.7024
20175	1732.5	1.0874	1.0887	1.0862	20175	1732.5	2.7017	2.6970	2.7016
20393	1754.3	1.0866	1.0882	1.0866	20385	1753.5	2.7001	2.6977	2.7031

Spectrum Plot of Worst Value

1.4 MHz / 16QAM

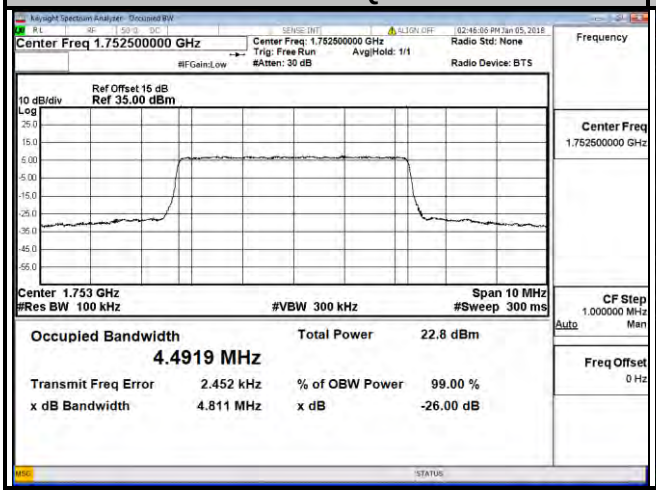


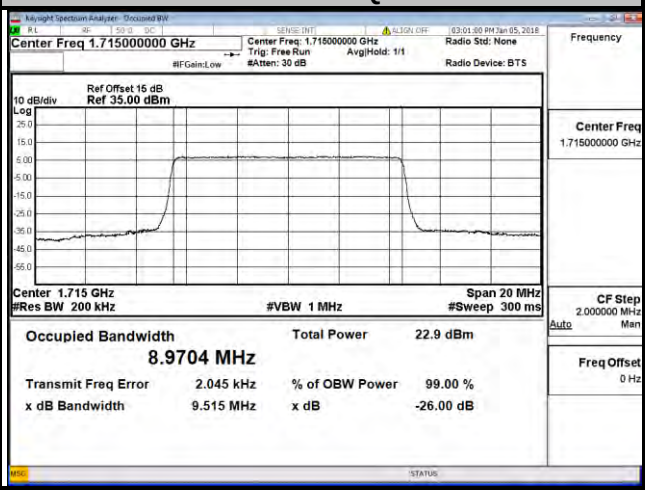
3 MHz / 64QAM



LTE Band 4									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
19975	1712.5	4.4873	4.4888	4.4913	20000	1715.0	8.9661	8.9704	8.9609
20175	1732.5	4.4870	4.4886	4.4900	20175	1732.5	8.9658	8.9669	8.9620
20375	1752.5	4.4869	4.4919	4.4895	20350	1750.0	8.9661	8.9695	8.9627

Spectrum Plot of Worst Value	
5 MHz / 16QAM	10 MHz / 16QAM

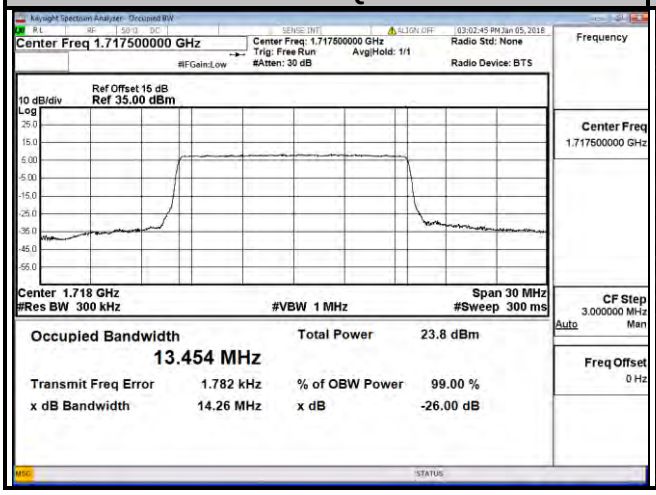




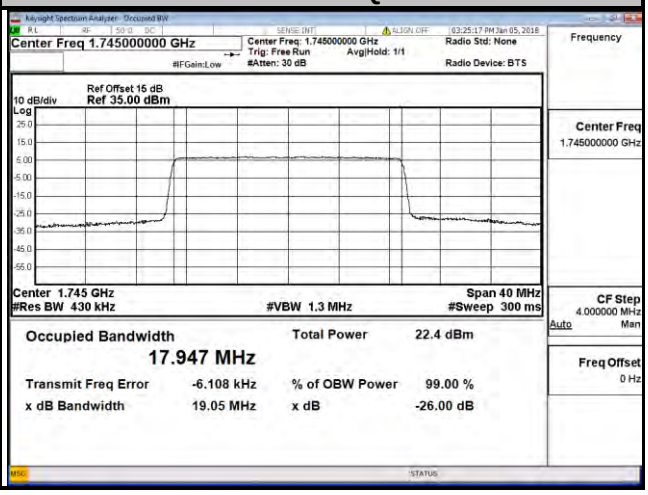
LTE Band 4									
Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
20025	1717.5	13.454	13.440	13.437	20050	1720.0	17.908	17.937	17.929
20175	1732.5	13.452	13.442	13.438	20175	1732.5	17.912	17.942	17.927
20325	1747.5	13.454	13.445	13.439	20300	1745.0	17.926	17.947	17.937

Spectrum Plot of Worst Value

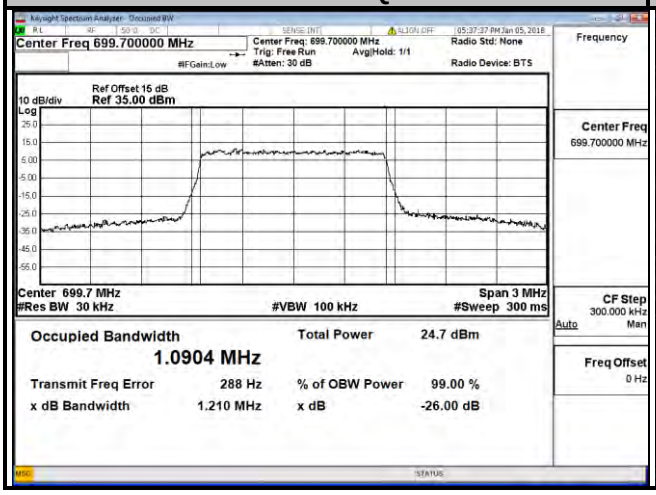
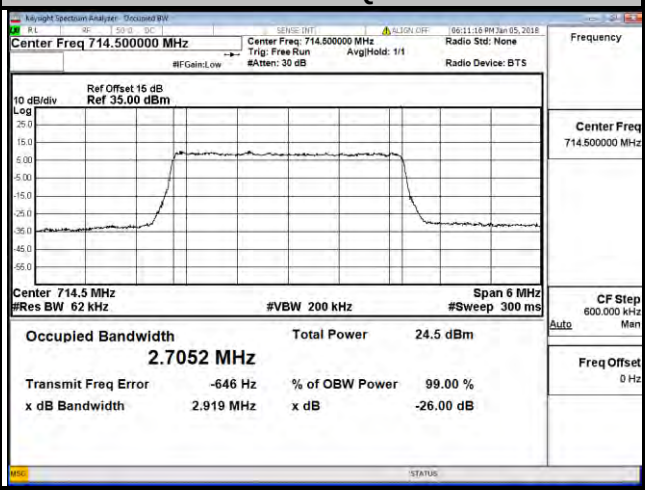
15 MHz / QPSK



20 MHz / 16QAM



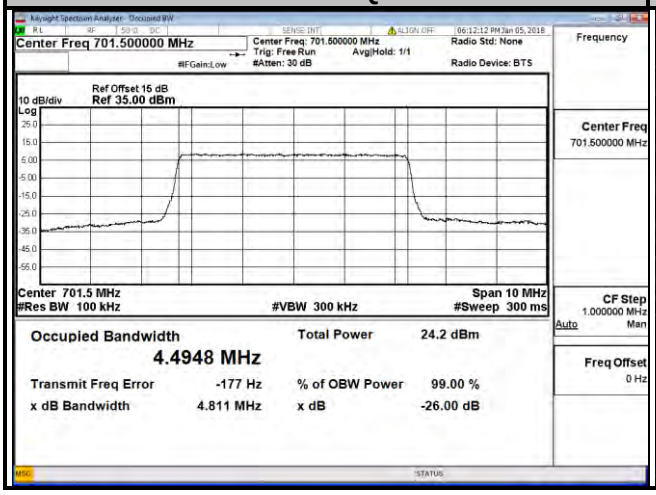
LTE Band 12									
Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23017	699.7	1.0872	1.0904	1.0865	23025	700.5	2.7035	2.6976	2.7041
23095	707.5	1.0861	1.0860	1.0854	23095	707.5	2.6995	2.6963	2.7010
23173	715.3	1.0865	1.0896	1.0870	23165	714.5	2.7015	2.6973	2.7052

Spectrum Plot of Worst Value	
1.4 MHz / 16QAM	3 MHz / 64QAM
	

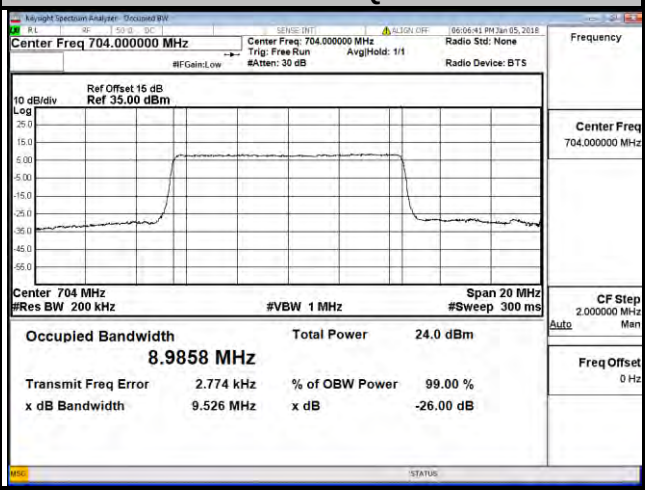
LTE Band 12									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23035	701.5	4.4891	4.4918	4.4948	23060	704.0	8.9790	8.9858	8.9732
23095	707.5	4.4858	4.4893	4.4908	23095	707.5	8.9627	8.9645	8.9627
23155	713.5	4.4856	4.4906	4.4907	23130	711.0	8.9527	8.9575	8.9507

Spectrum Plot of Worst Value

5 MHz / 64QAM

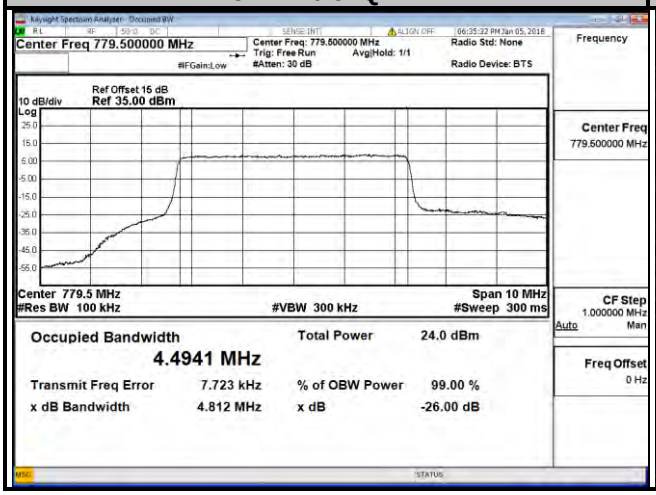


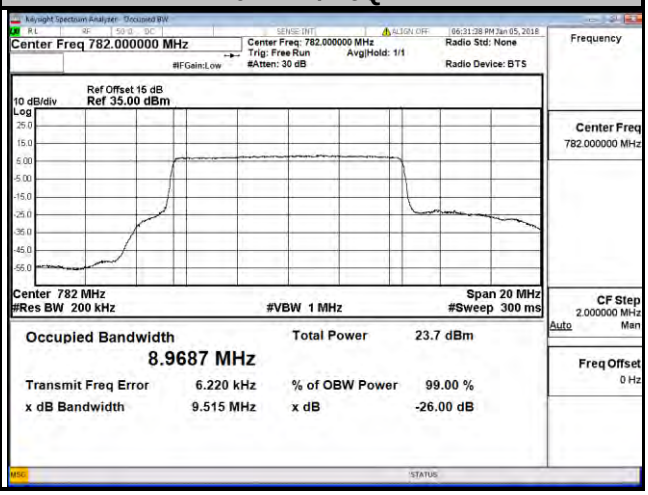
10 MHz / 16QAM



LTE Band 13									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23205	779.5	4.4912	4.4913	4.4941	23230	782.0	8.9556	8.9687	8.9531
23230	782.0	4.4838	4.4890	4.4921					
23255	784.5	4.4865	4.4886	4.4861					

Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 16QAM

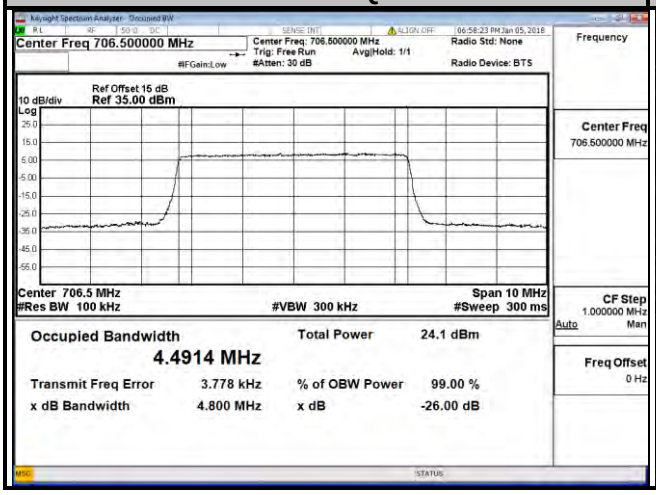




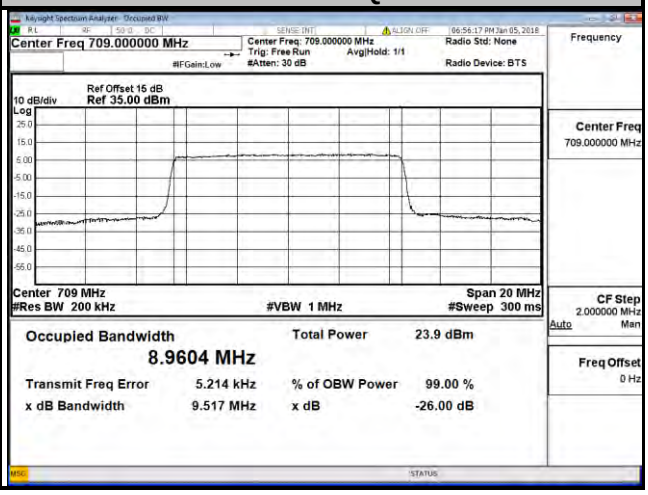
LTE Band 17									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23755	706.5	4.4872	4.4887	4.4914	23780	709.0	8.9549	8.9604	8.9526
23790	710.0	4.4846	4.4880	4.4886	23790	710.0	8.9502	8.9591	8.9500
23825	713.5	4.4881	4.4896	4.4893	23800	711.0	8.9537	8.9537	8.9504

Spectrum Plot of Worst Value

5 MHz / 64QAM

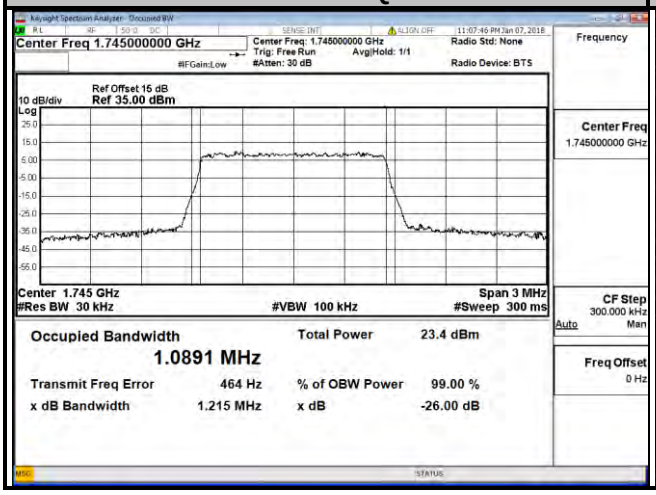


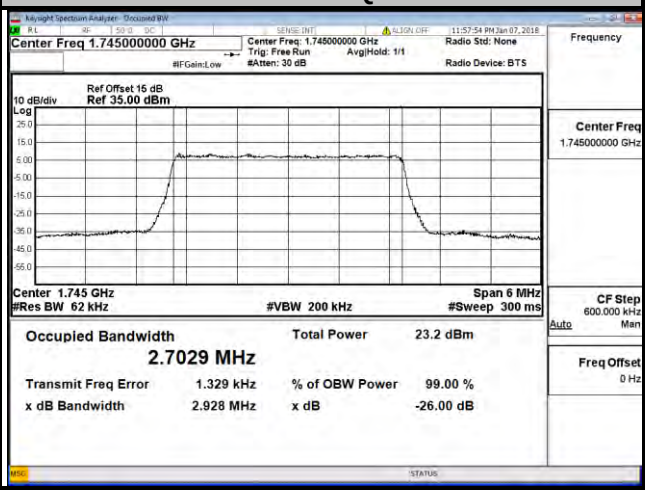
10 MHz / 16QAM



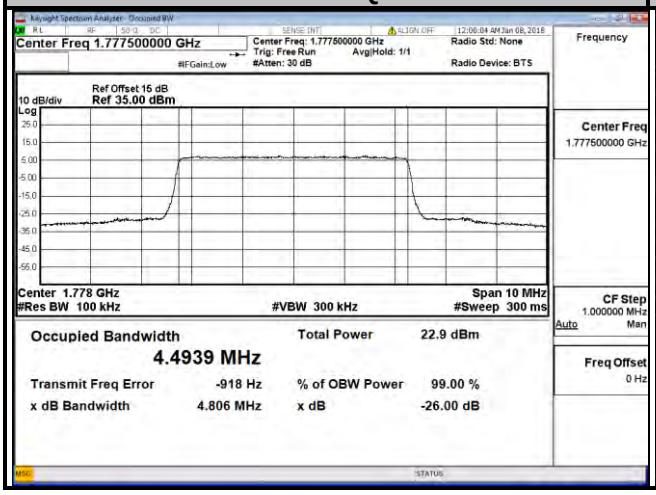
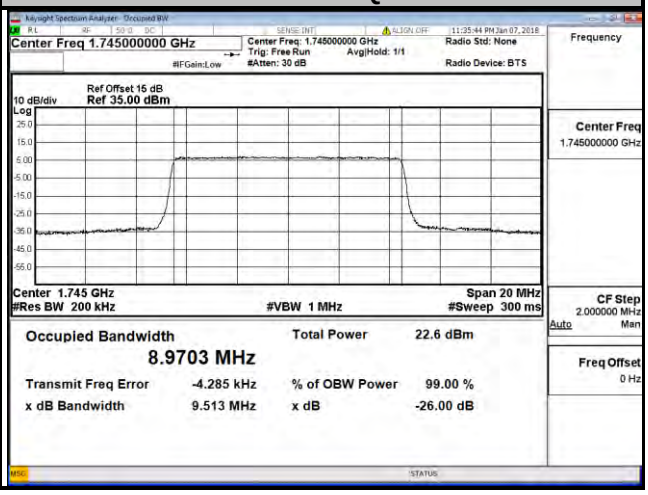
LTE Band 66									
Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
131979	1710.7	1.0874	1.0889	1.0864	131987	1711.5	2.6993	2.6976	2.7023
132322	1745.0	1.0866	1.0891	1.0859	132322	1745.0	2.7000	2.6966	2.7029
132665	1779.3	1.0871	1.0879	1.0867	132657	1778.5	2.7009	2.6981	2.7027

Spectrum Plot of Worst Value	
1.4 MHz / 16QAM	3 MHz / 64QAM





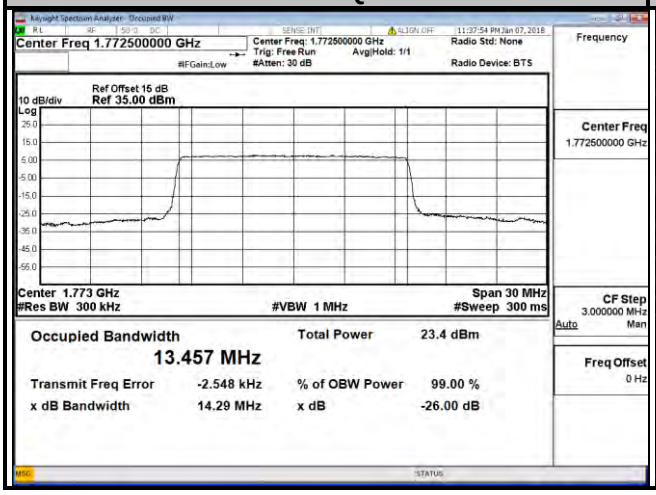
LTE Band 66									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
131997	1712.5	4.4858	4.4890	4.4886	132022	1715.0	8.9651	8.9656	8.9623
132322	1745.0	4.4857	4.4882	4.4882	132322	1745.0	8.9624	8.9703	8.9648
132647	1777.5	4.4881	4.4902	4.4939	132622	1775.0	8.9654	8.9679	8.9661

Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 16QAM
	

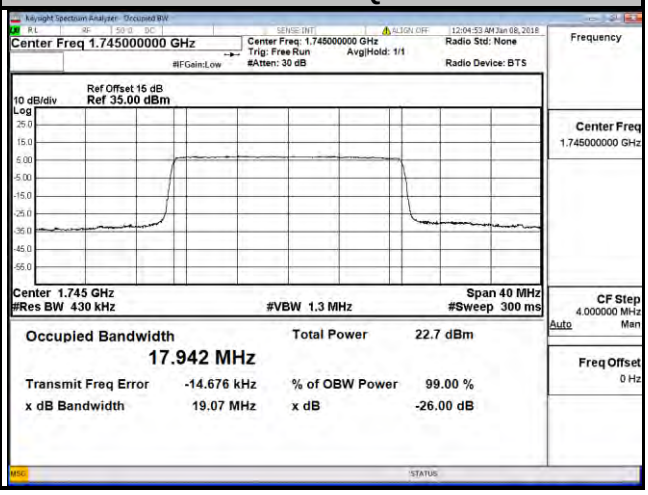
LTE Band 66									
Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
132047	1717.5	13.450	13.440	13.435	132072	1720.0	17.907	17.938	17.927
132322	1745.0	13.457	13.446	13.443	132322	1745.0	17.913	17.937	17.942
132597	1772.5	13.457	13.445	13.441	132572	1770.0	17.913	17.941	17.935

Spectrum Plot of Worst Value

15 MHz / QPSK



20 MHz / 64QAM



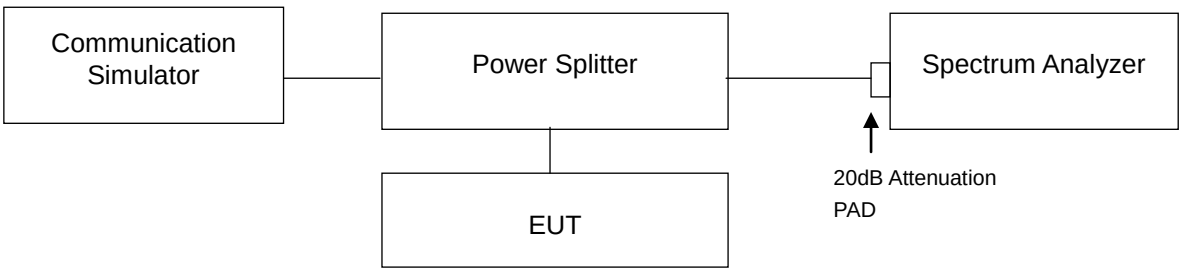
4.4 Band Edge Measurement

4.4.1 Limits of Band Edge Measurement

For operations in the 698-787 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.
However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

For operations in the 1710–1755 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

4.4.2 Test Setup

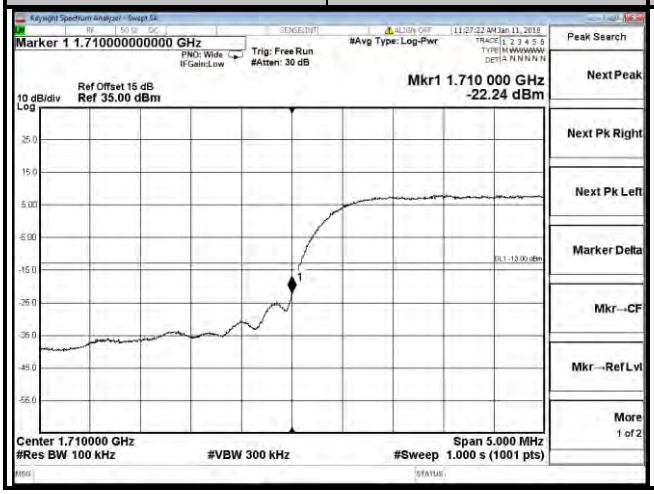


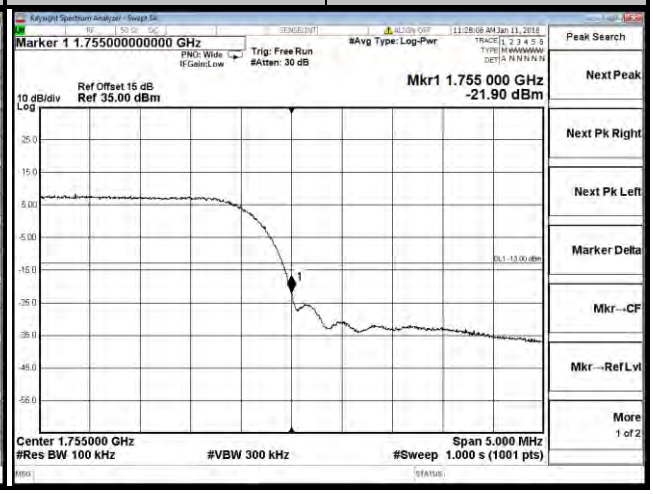
4.4.3 Test Procedures

a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (WCDMA).
c. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 13 kHz and VB of the spectrum is 51 kHz (LTE Bandwidth 1.4 MHz).
d. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 30 kHz and VB of the spectrum is 100 kHz (LTE Bandwidth 3 MHz).
e. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (LTE Bandwidth 5 MHz/10 MHz).
f. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 150 kHz and VB of the spectrum is 470 kHz (LTE Bandwidth 15 MHz).
g. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 180 kHz and VB of the spectrum is 560 kHz (LTE Bandwidth 20 MHz).
h. Record the max. trace plot into the test report.

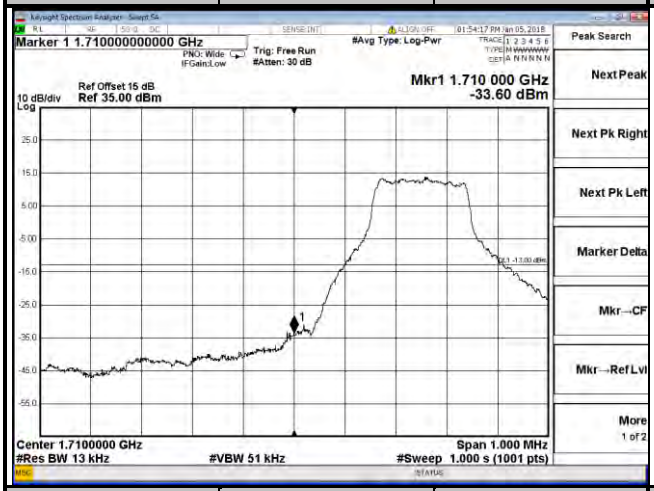
4.4.4 Test Results

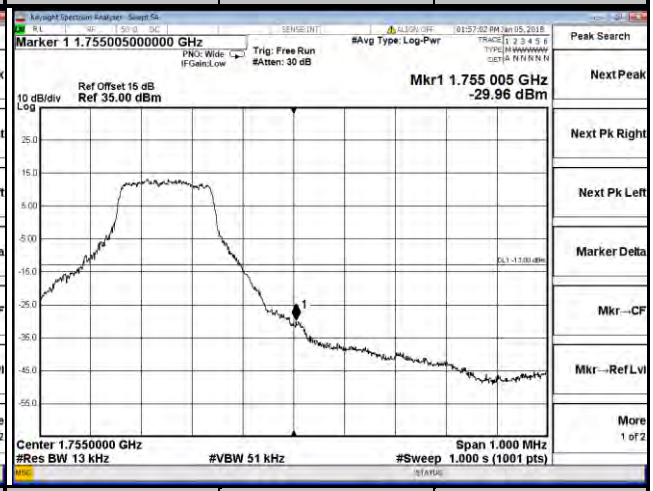
WCDMA			
Channel	1312	Channel	1513



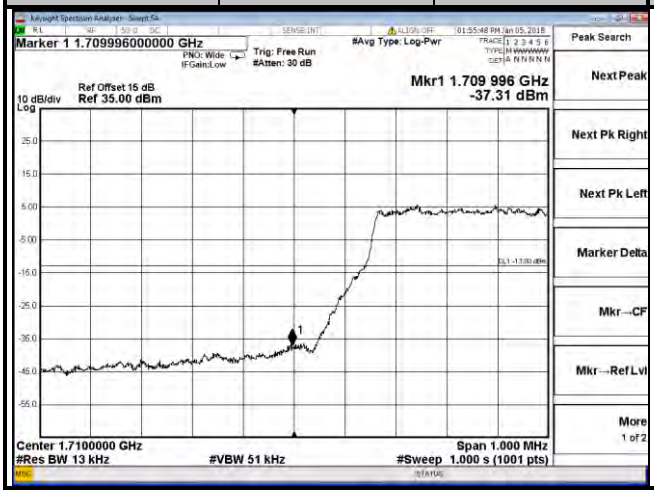


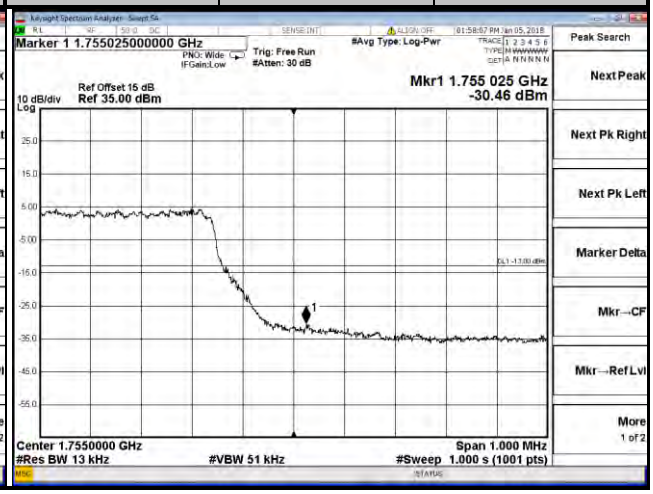
LTE Band 4					
Channel Bandwidth: 1.4 MHz					
Channel	19957	1 RB	Channel	20393	1 RB

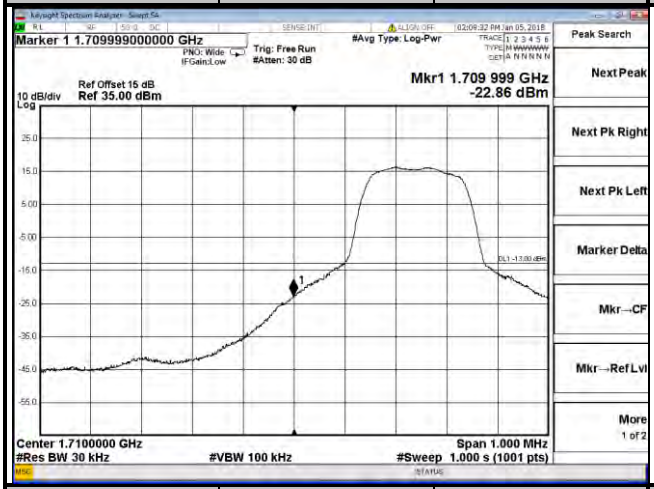
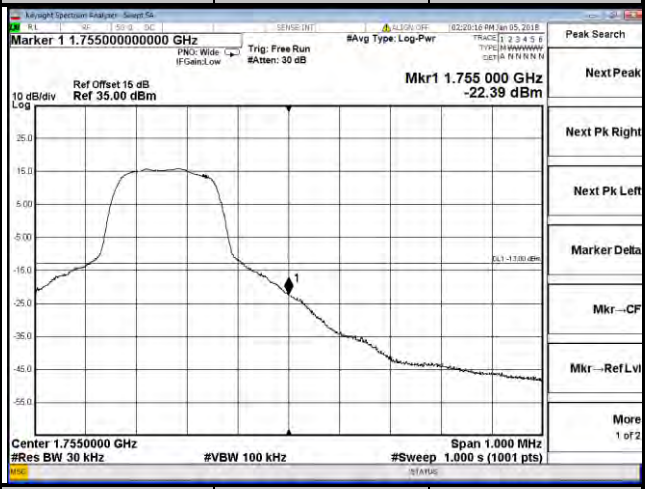
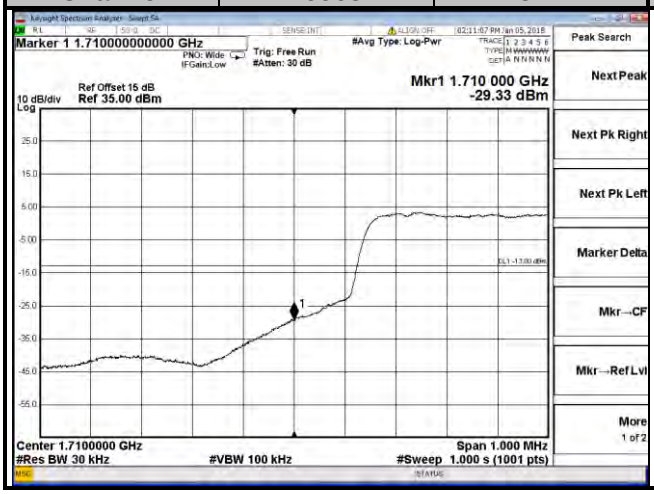
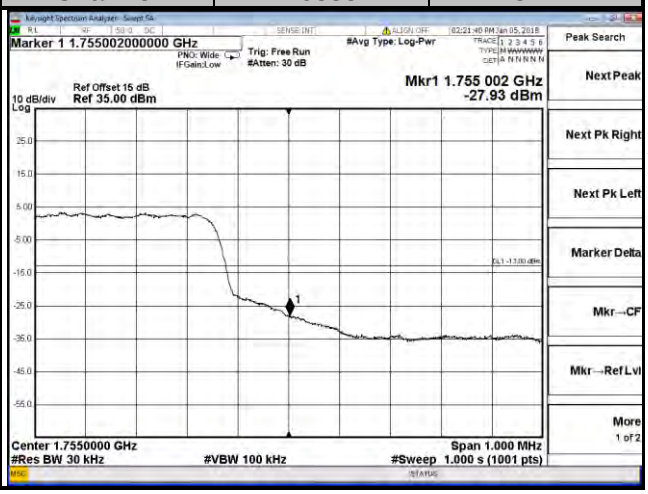


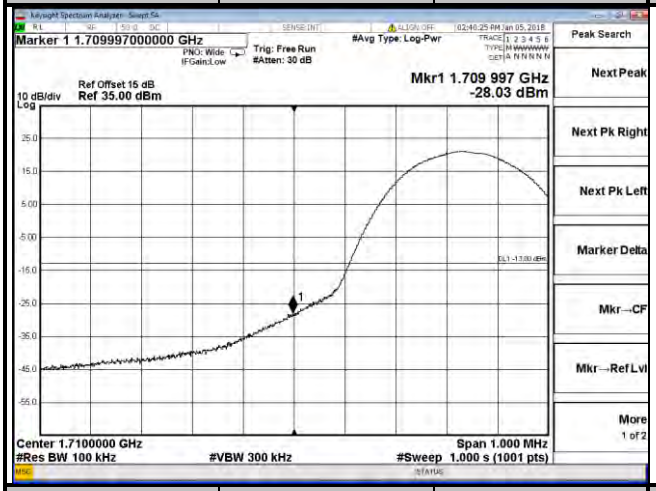
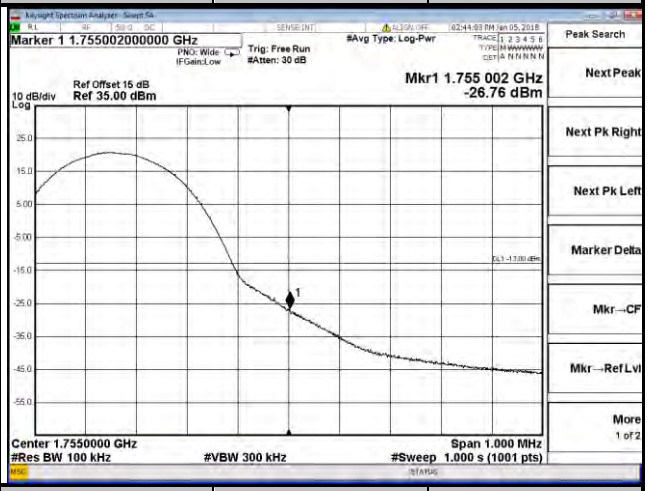
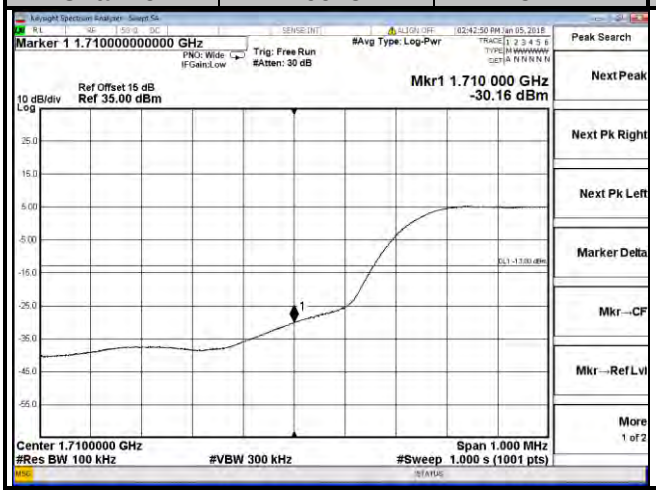
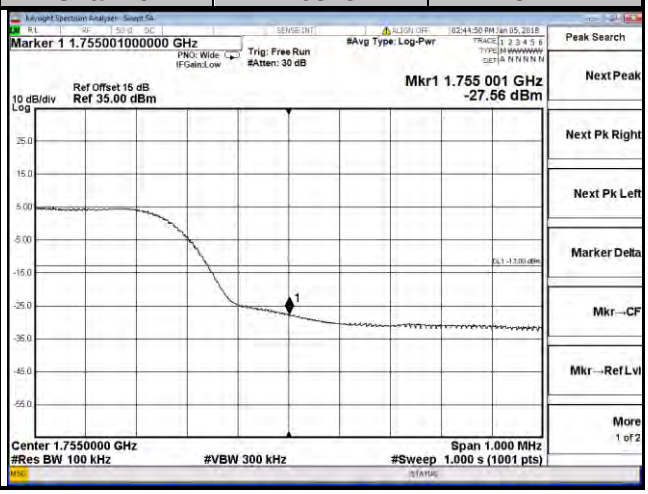


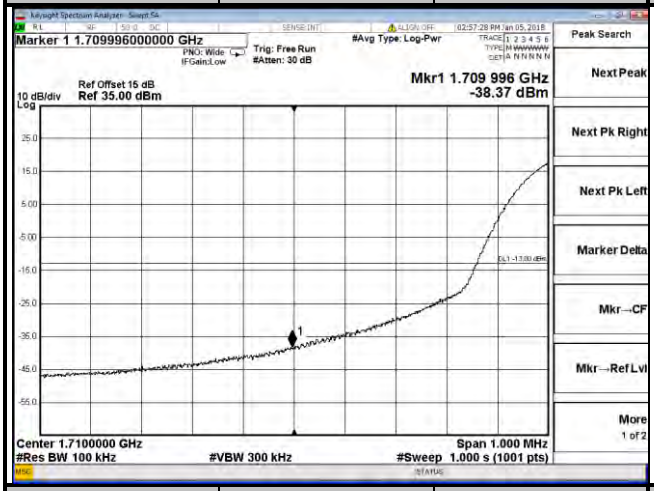
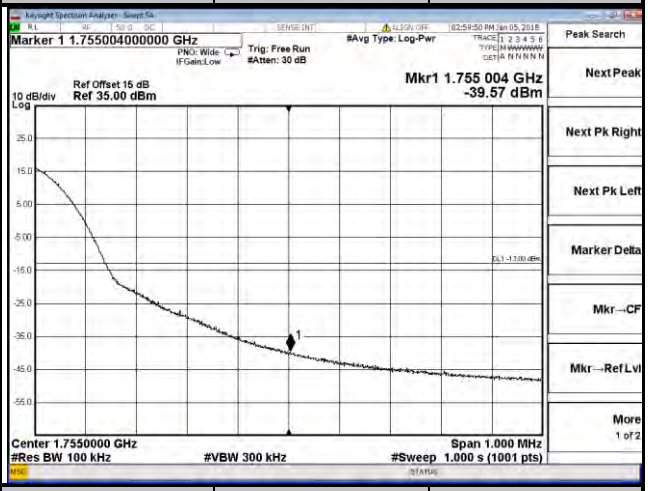
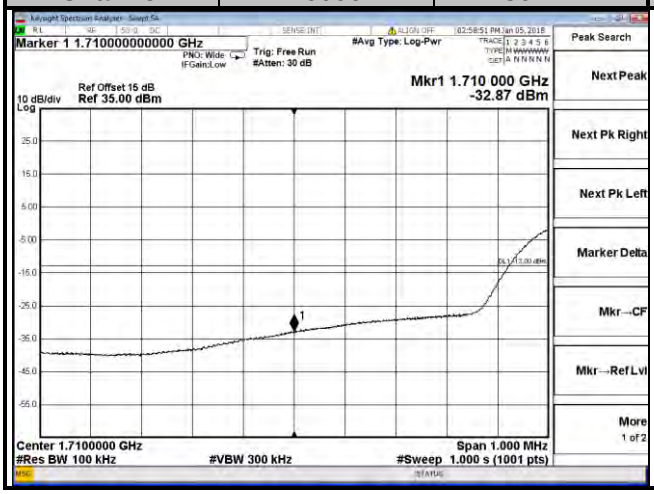
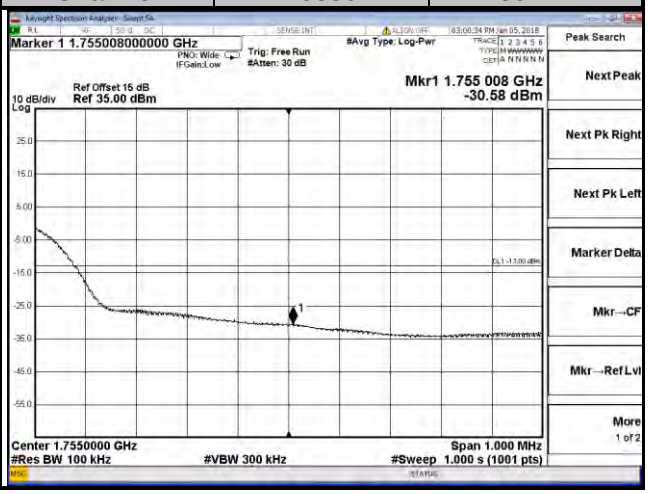
Channel	19957	6 RB	Channel	20393	6 RB

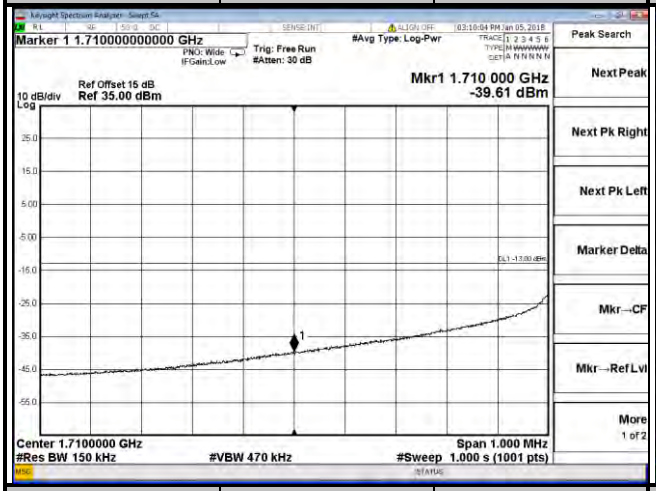
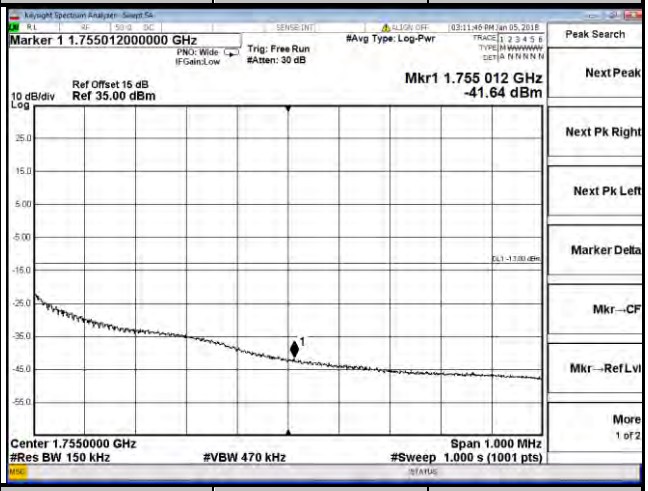
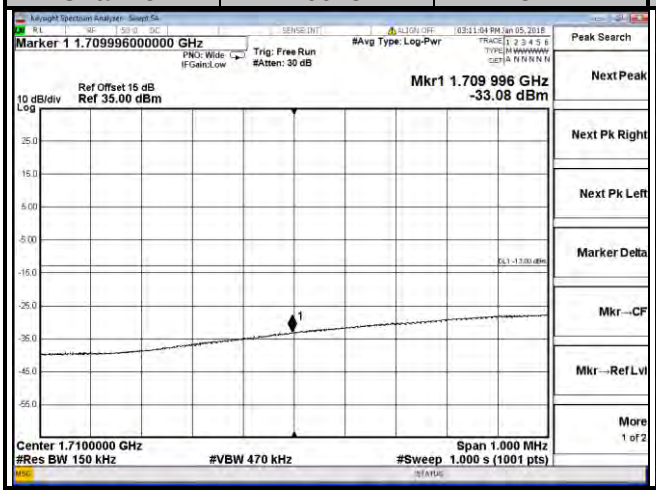
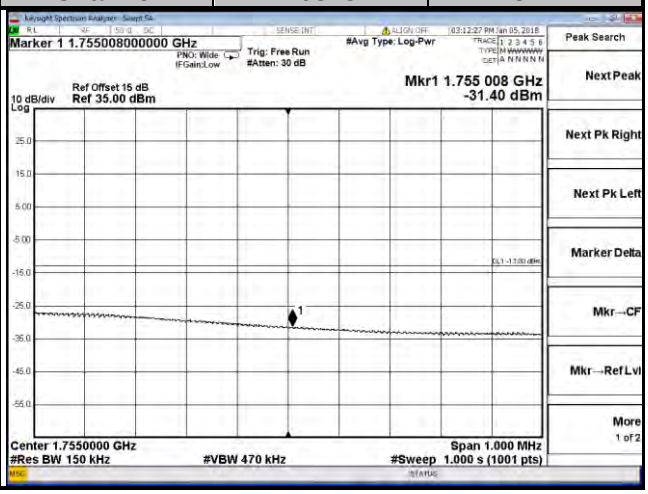


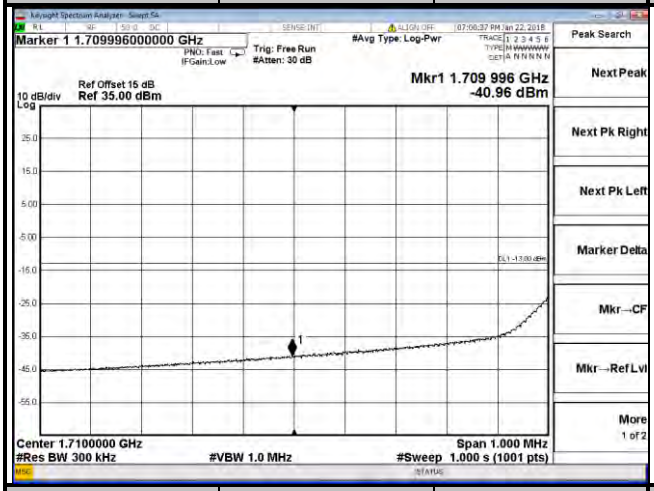
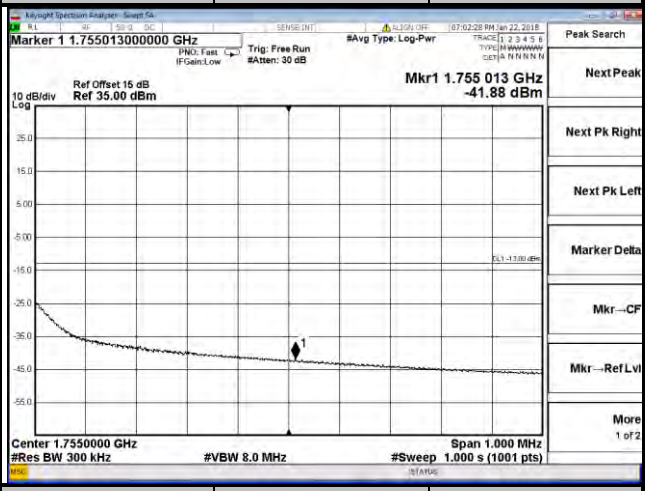
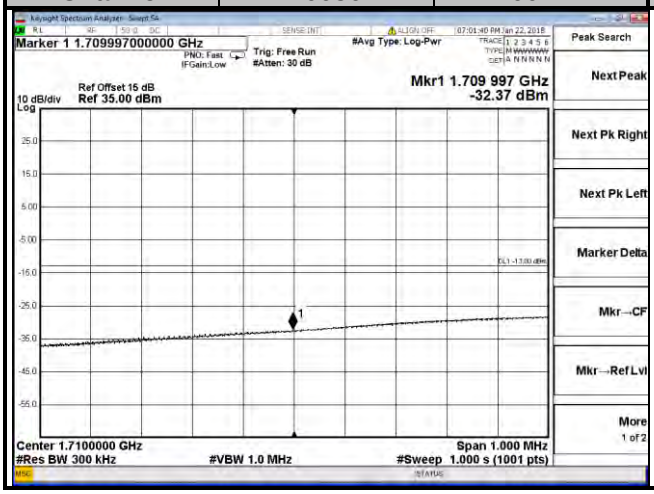
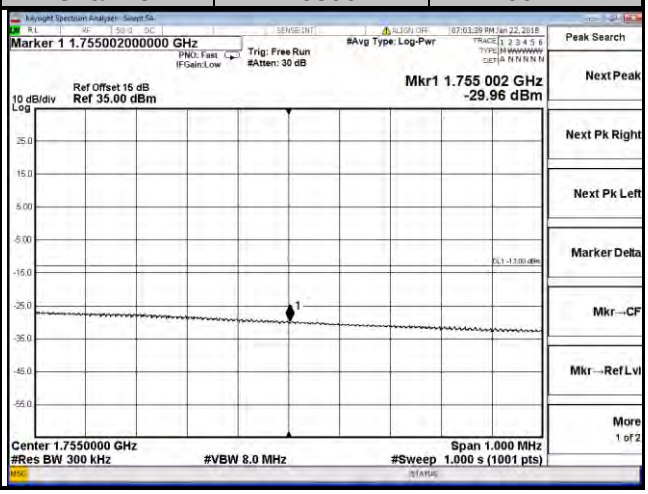


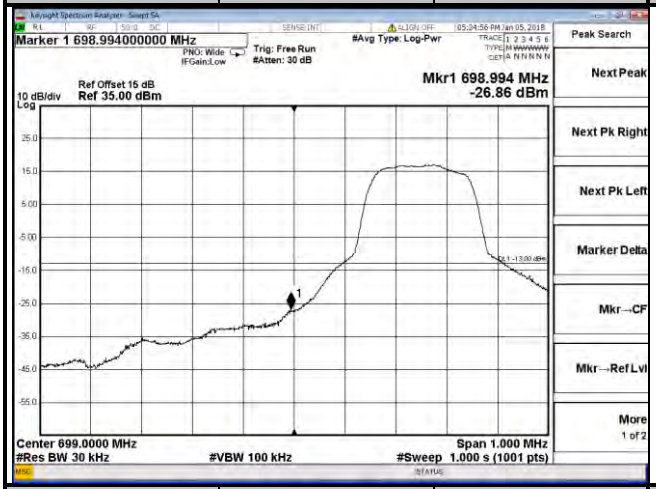
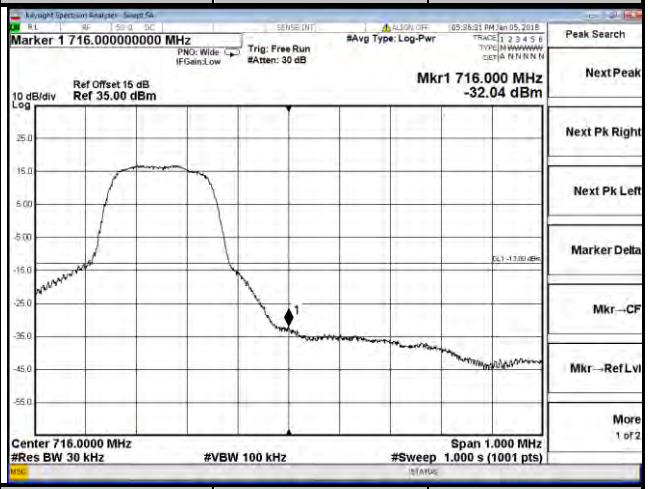
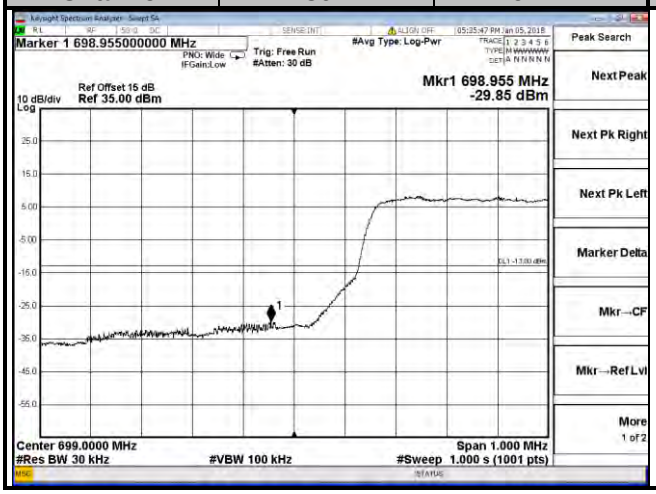
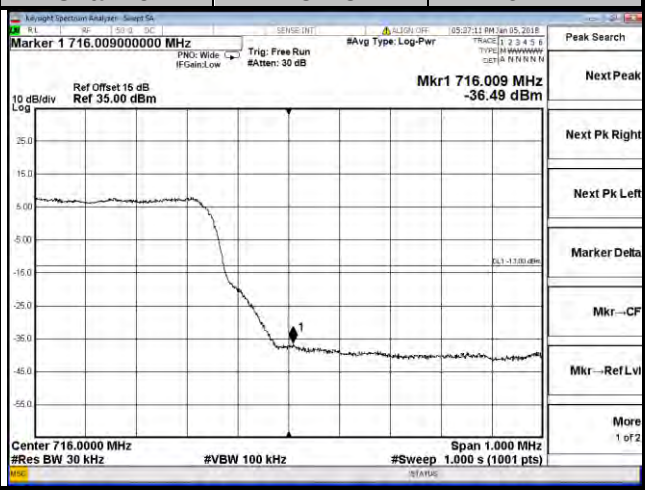
LTE Band 4					
Channel Bandwidth: 3 MHz					
Channel	19965	1 RB	Channel	20385	1 RB
					
Channel	19965	15 RB	Channel	20385	15 RB
					

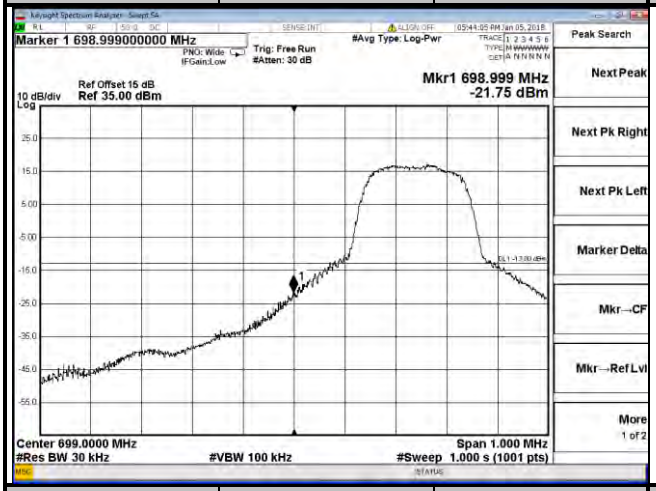
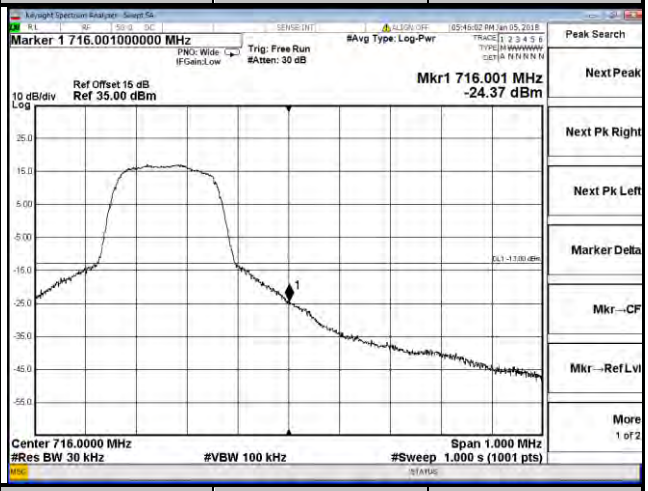
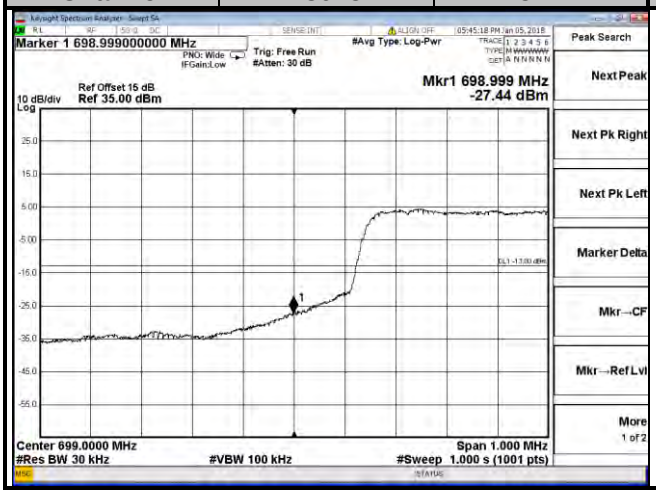
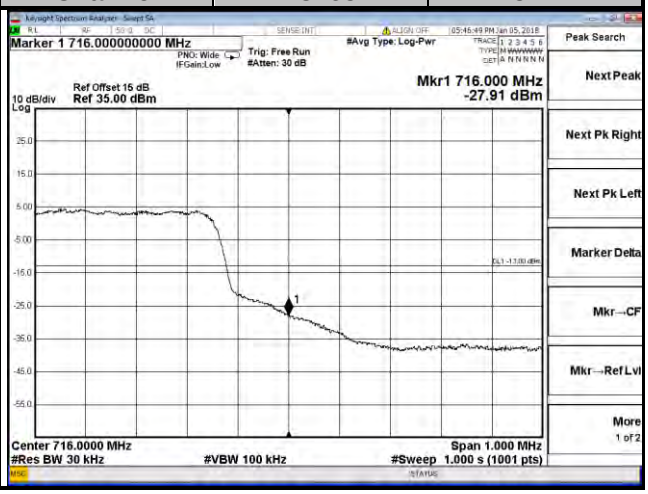
LTE Band 4					
Channel Bandwidth: 5 MHz					
Channel	19975	1 RB	Channel	20375	1 RB
					
Channel	19975	25 RB	Channel	20375	25 RB
					

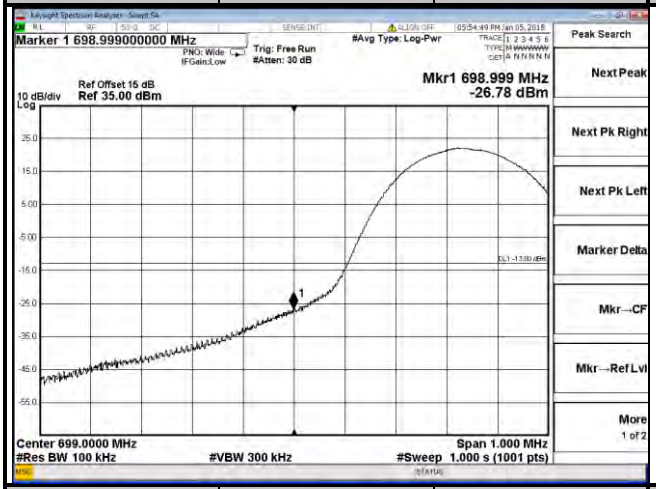
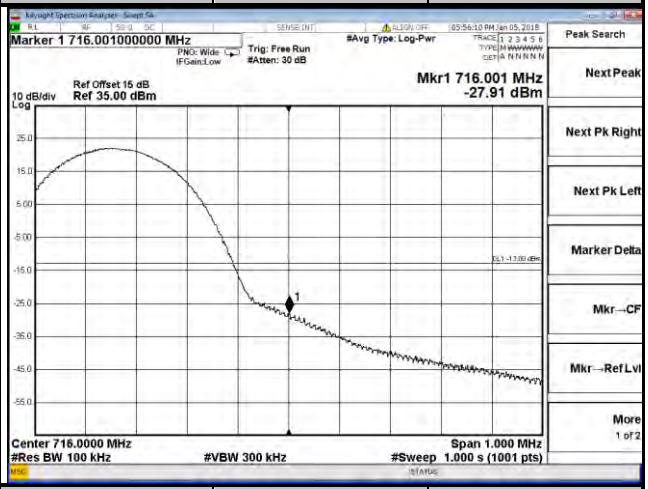
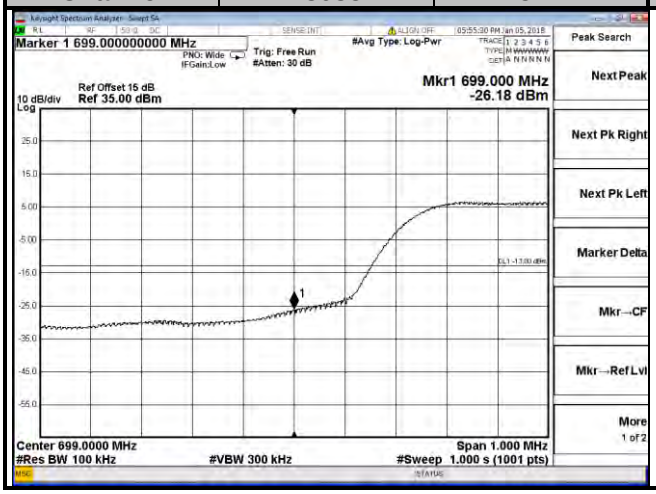
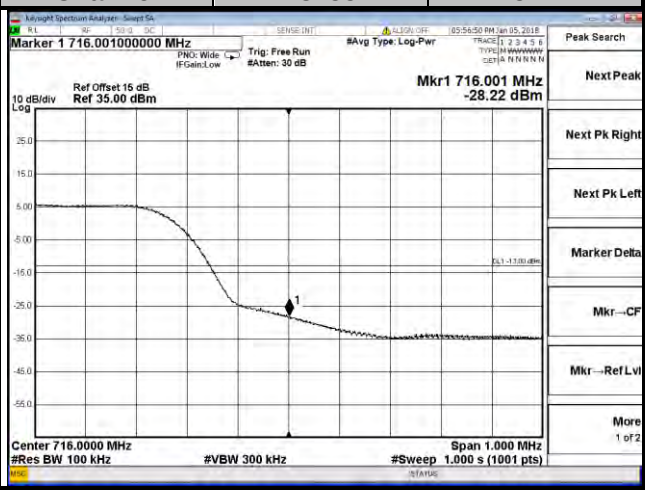
LTE Band 4					
Channel Bandwidth: 10 MHz					
Channel	20000	1 RB	Channel	20350	1 RB
					
Channel	20000	50 RB	Channel	20350	50 RB
					

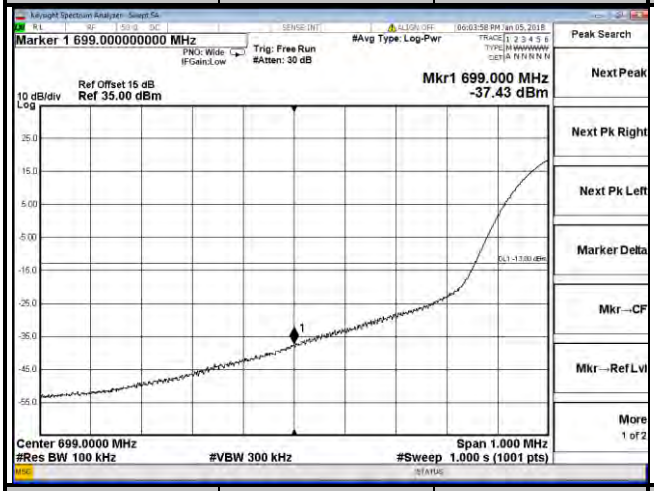
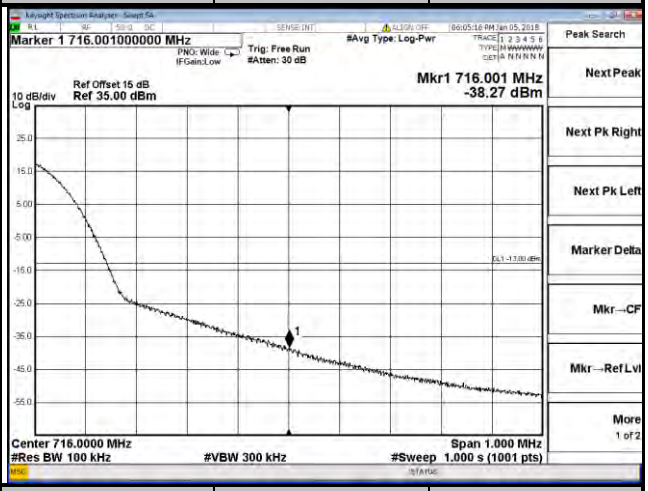
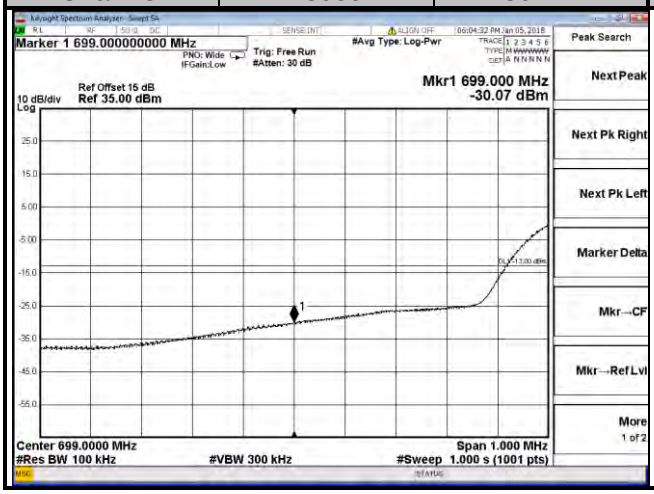
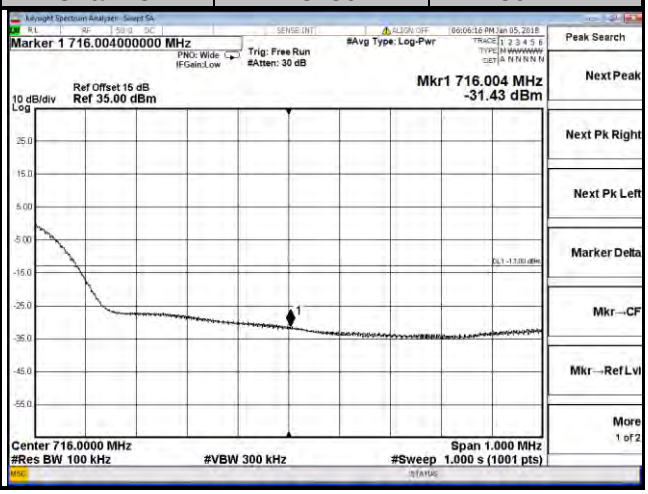
LTE Band 4					
Channel Bandwidth: 15 MHz					
Channel	20025	1 RB	Channel	20325	1 RB
					
Channel	20025	75 RB	Channel	20325	75 RB
					

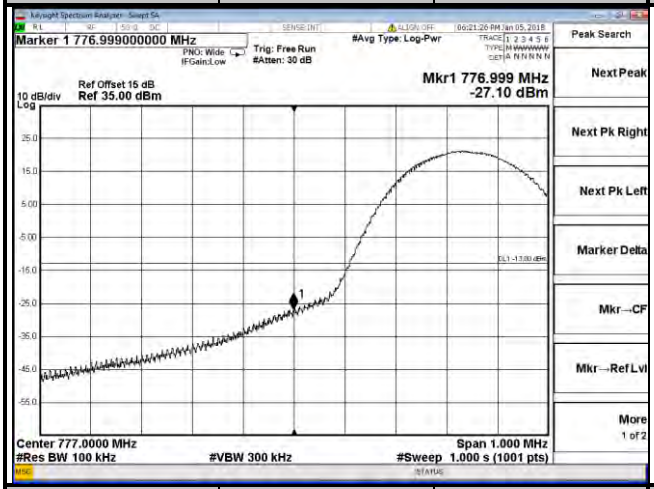
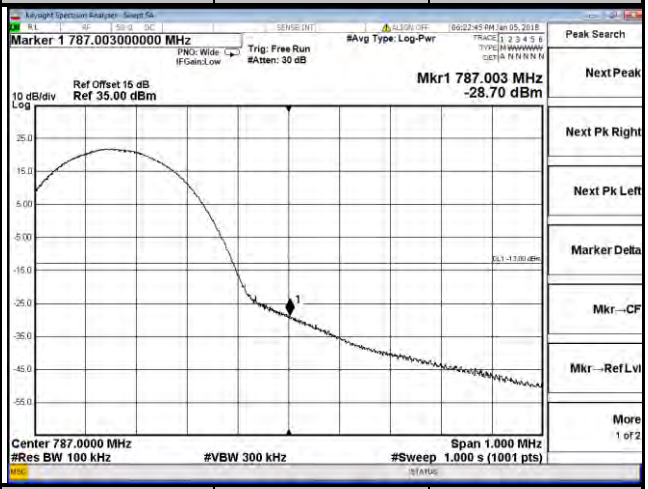
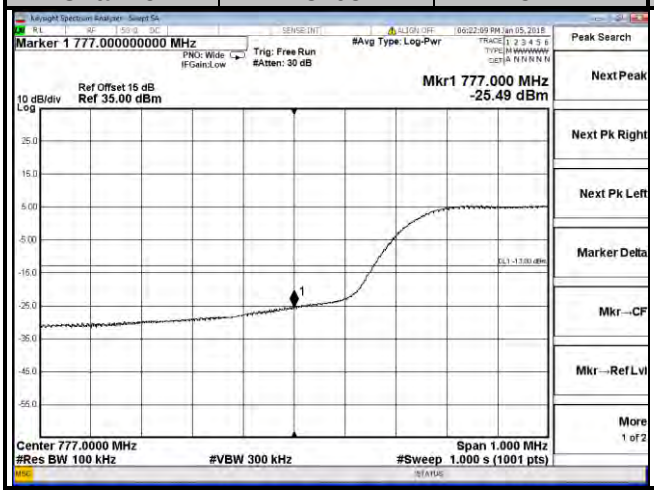
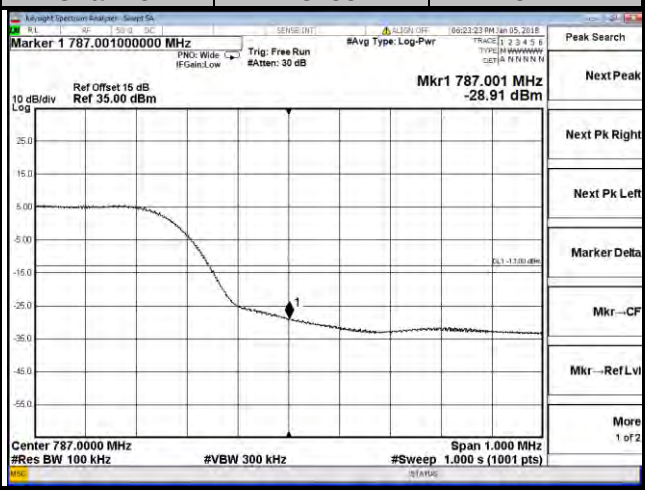
LTE Band 4					
Channel Bandwidth: 20 MHz					
Channel	20050	1 RB	Channel	20300	1 RB
					
Channel	20050	100 RB	Channel	20300	100 RB
					

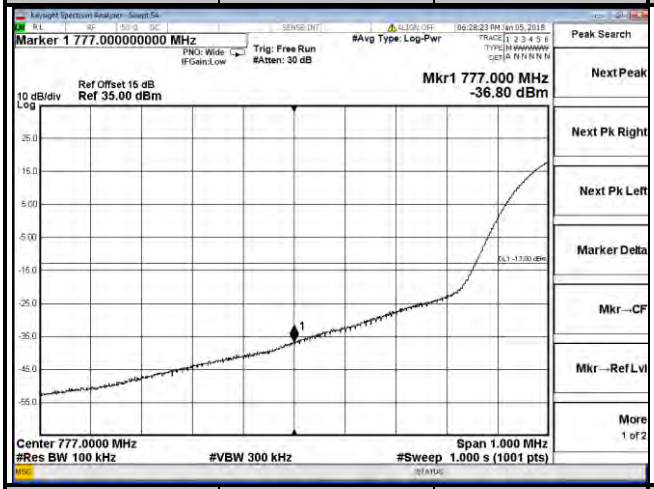
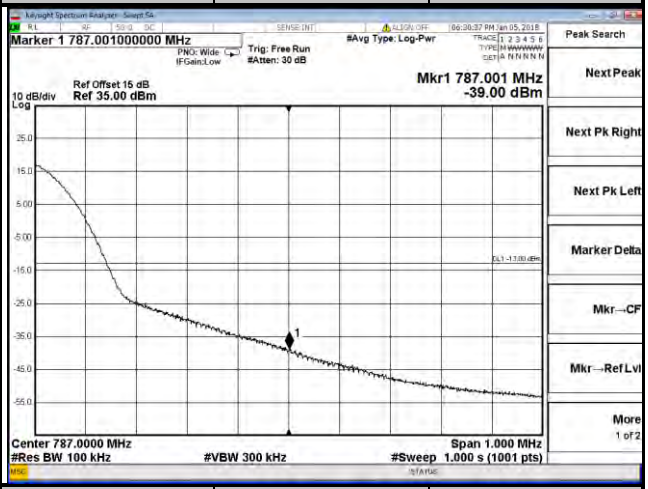
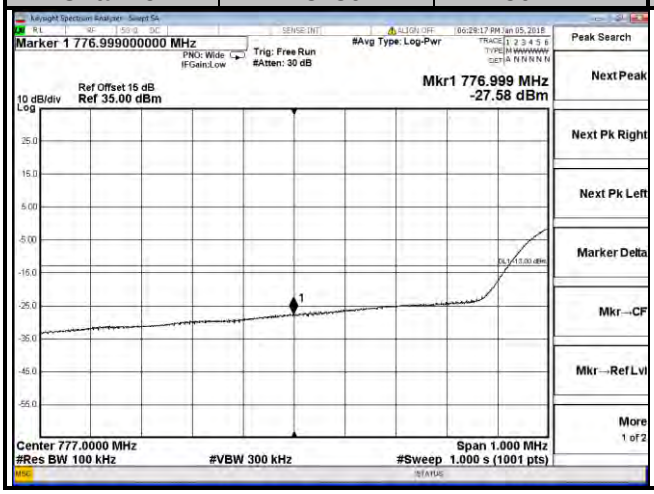
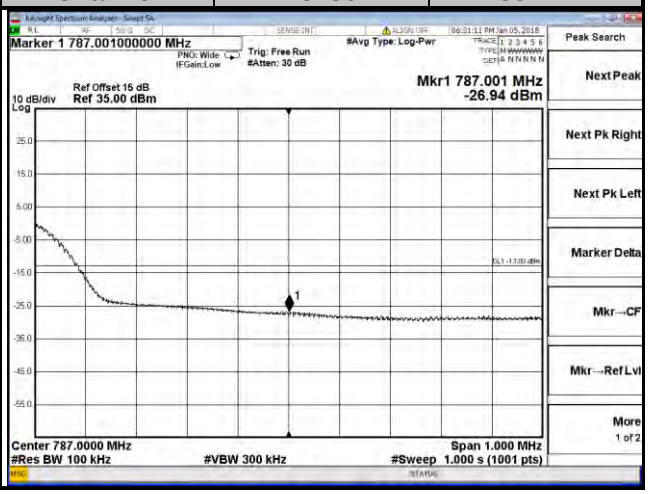
LTE Band 12					
Channel Bandwidth: 1.4 MHz					
Channel	23017	1 RB	Channel	23173	1 RB
					
Channel	23017	6 RB	Channel	23173	6 RB
					

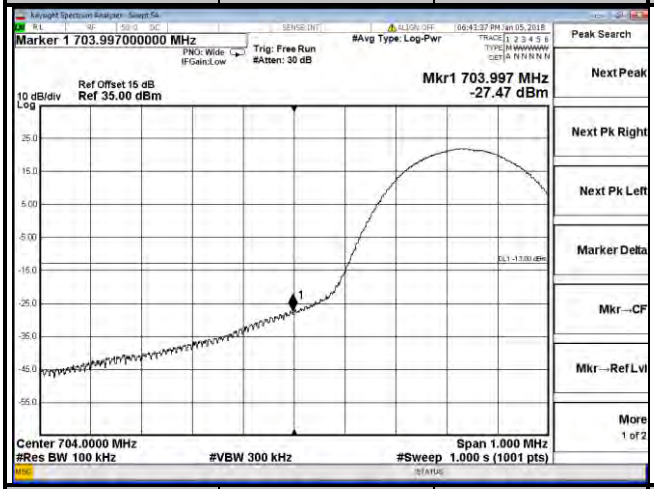
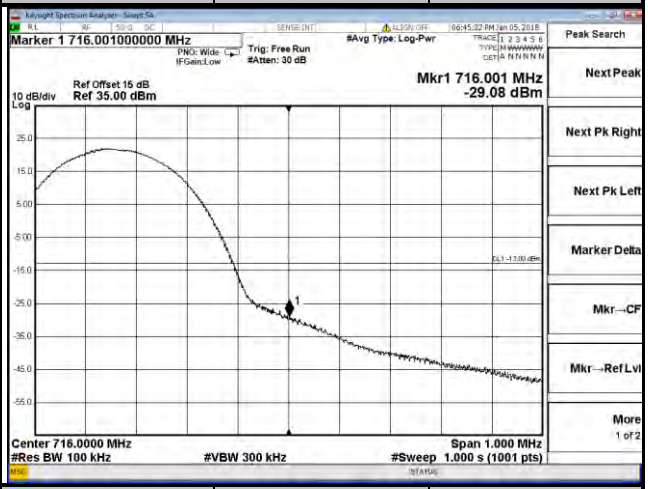
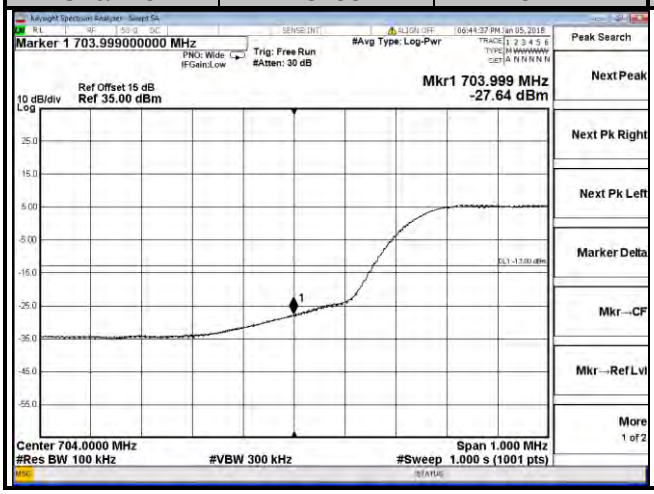
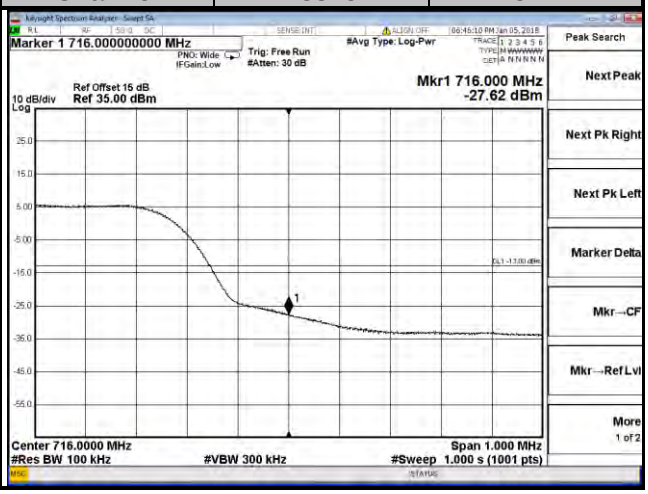
LTE Band 12					
Channel Bandwidth: 3 MHz					
Channel	23025	1 RB	Channel	23165	1 RB
					
Channel	23025	15 RB	Channel	23165	15 RB
					

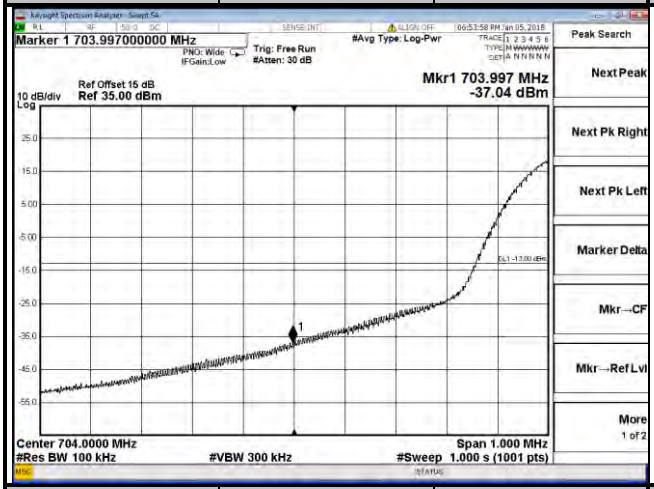
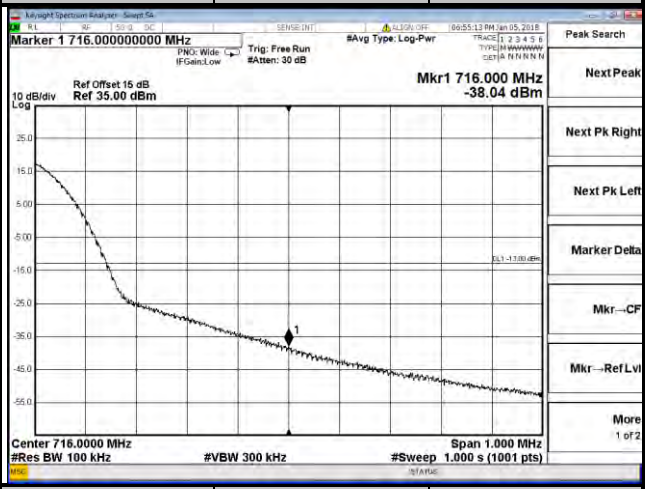
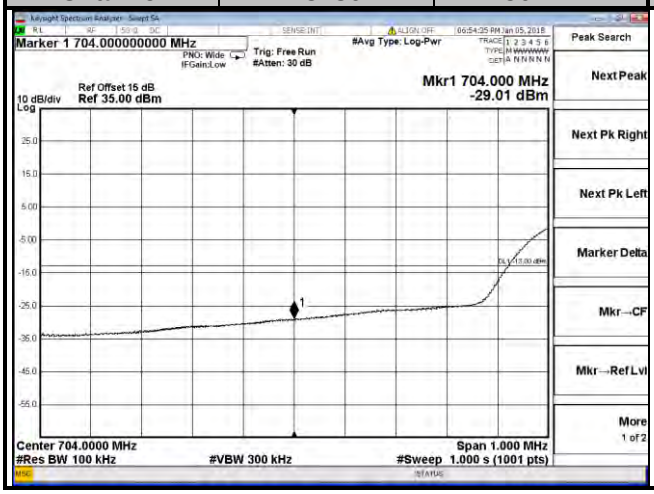
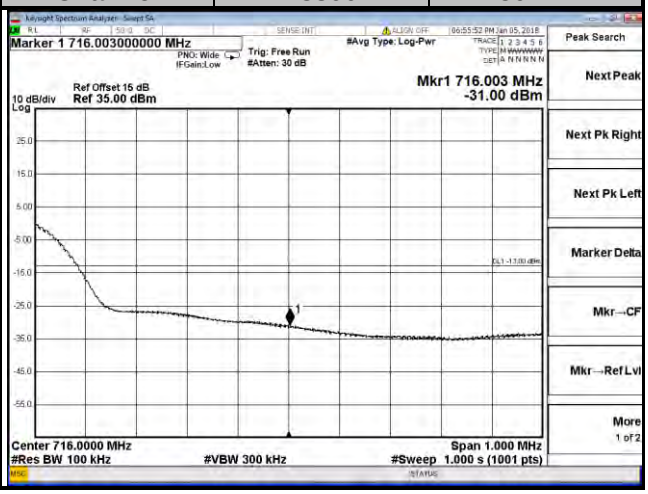
LTE Band 12					
Channel Bandwidth: 5 MHz					
Channel	23035	1 RB	Channel	23155	1 RB
					
Channel	23035	25 RB	Channel	23155	25 RB
					

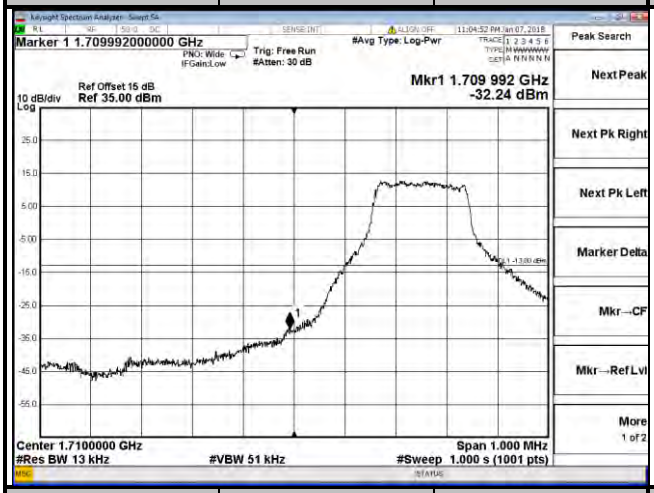
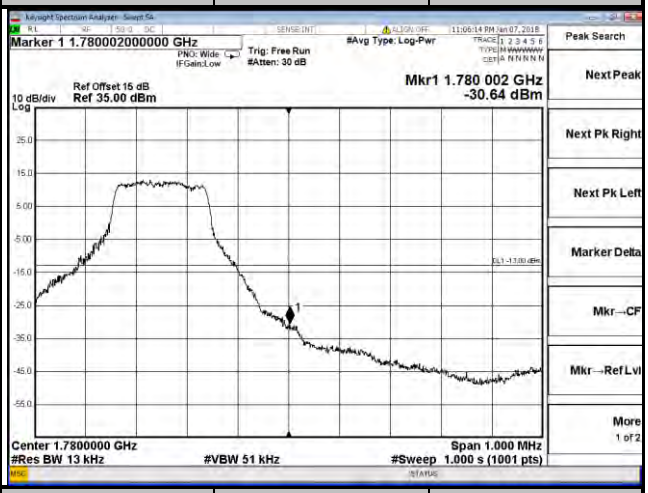
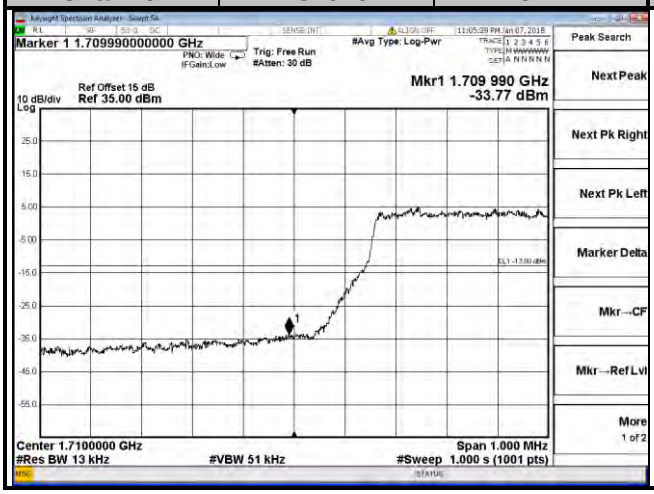
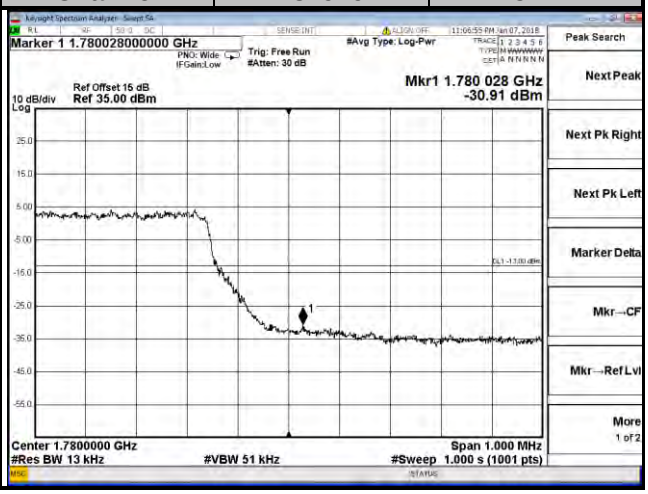
LTE Band 12					
Channel Bandwidth: 10 MHz					
Channel	23060	1 RB	Channel	23130	1 RB
					
Channel	23060	50 RB	Channel	23130	50 RB
					

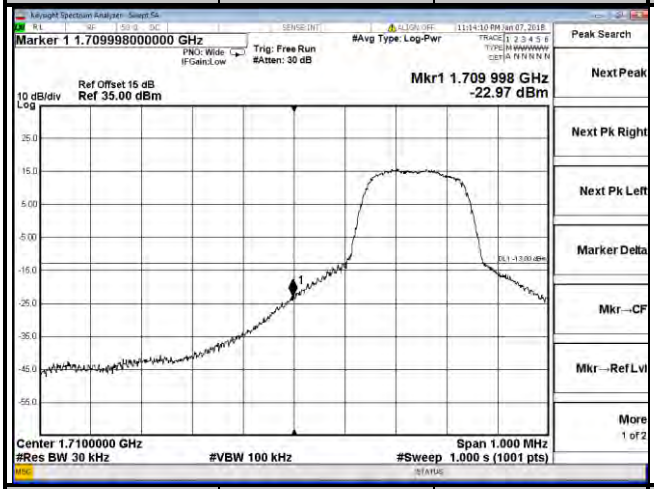
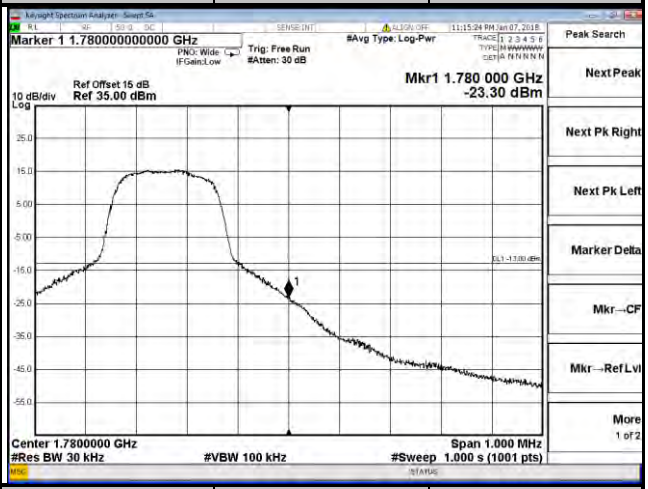
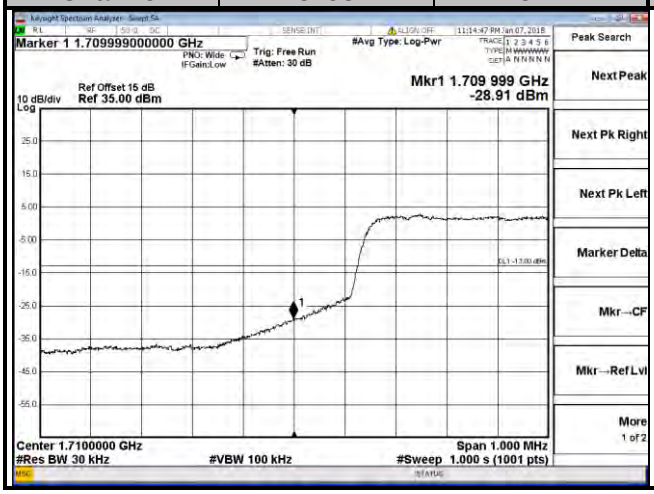
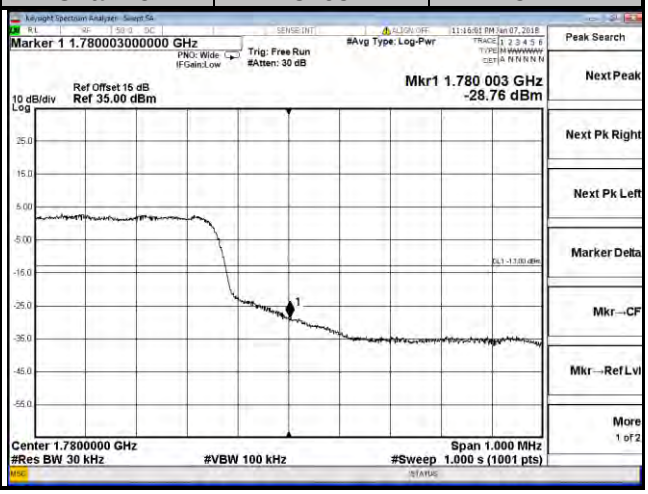
LTE Band 13					
Channel Bandwidth: 5 MHz					
Channel	23205	1 RB	Channel	23255	1 RB
					
Channel	23205	25 RB	Channel	23255	25 RB
					

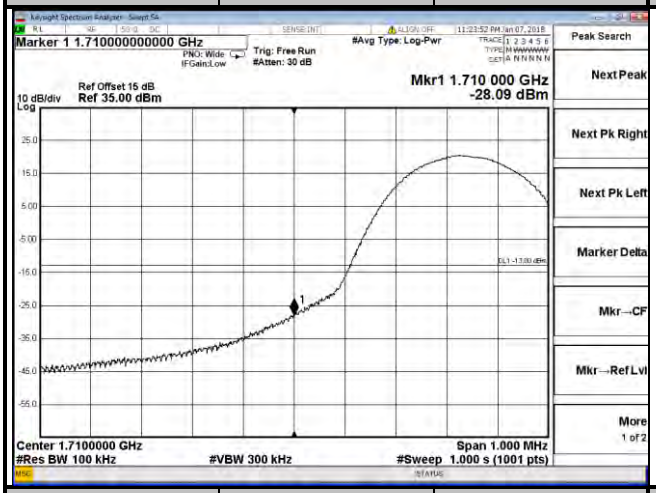
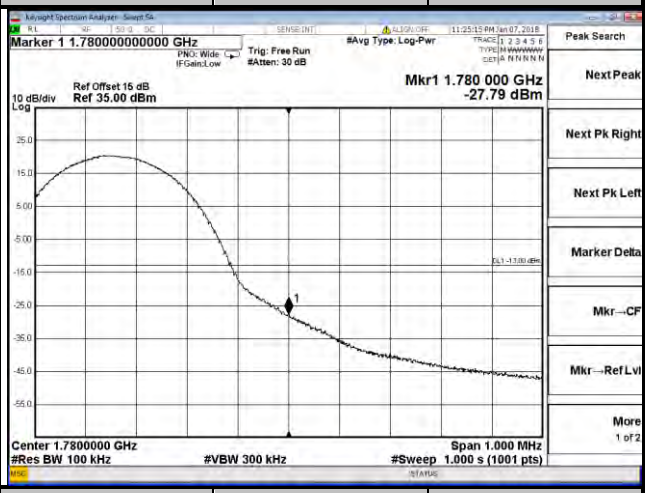
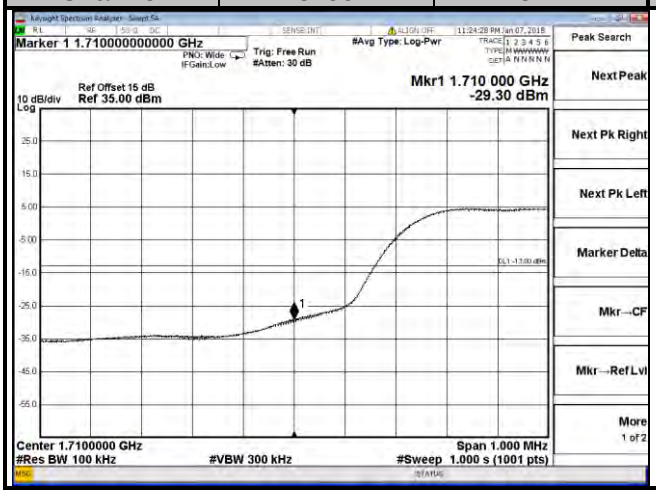
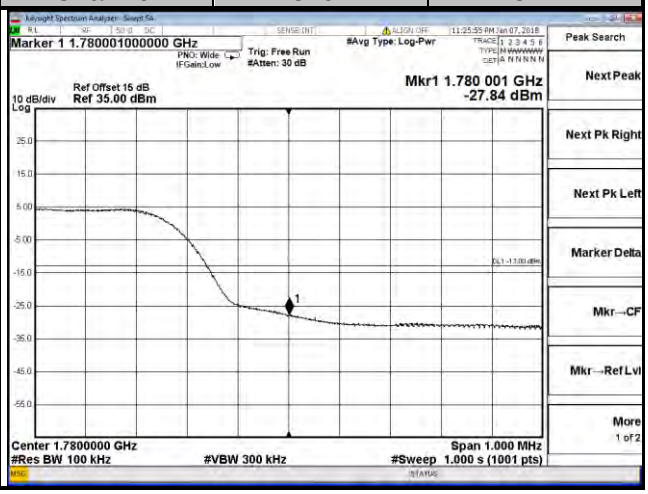
LTE Band 13					
Channel Bandwidth: 10 MHz					
Channel	23230	1 RB	Channel	23230	1 RB
					
Channel	23230	50 RB	Channel	23230	50 RB
					

LTE Band 17					
Channel Bandwidth: 5 MHz					
Channel	23755	1 RB	Channel	23825	1 RB
					
Channel	23755	25 RB	Channel	23825	25 RB
					

LTE Band 17					
Channel Bandwidth: 10 MHz					
Channel	23780	1 RB	Channel	23800	1 RB
					
Channel	23780	50 RB	Channel	23800	50 RB
					

LTE Band 66					
Channel Bandwidth: 1.4 MHz					
Channel	131979	6 RB	Channel	131979	6 RB
					
Channel	131979	25 RB	Channel	131979	25 RB
					

LTE Band 66					
Channel Bandwidth: 3 MHz					
Channel	131987	1 RB	Channel	132657	1 RB
					
Channel	131987	15 RB	Channel	132657	15 RB
					

LTE Band 66					
Channel Bandwidth: 5 MHz					
Channel	131997	1 RB	Channel	132647	1 RB
					
Channel	131997	25 RB	Channel	132647	25 RB